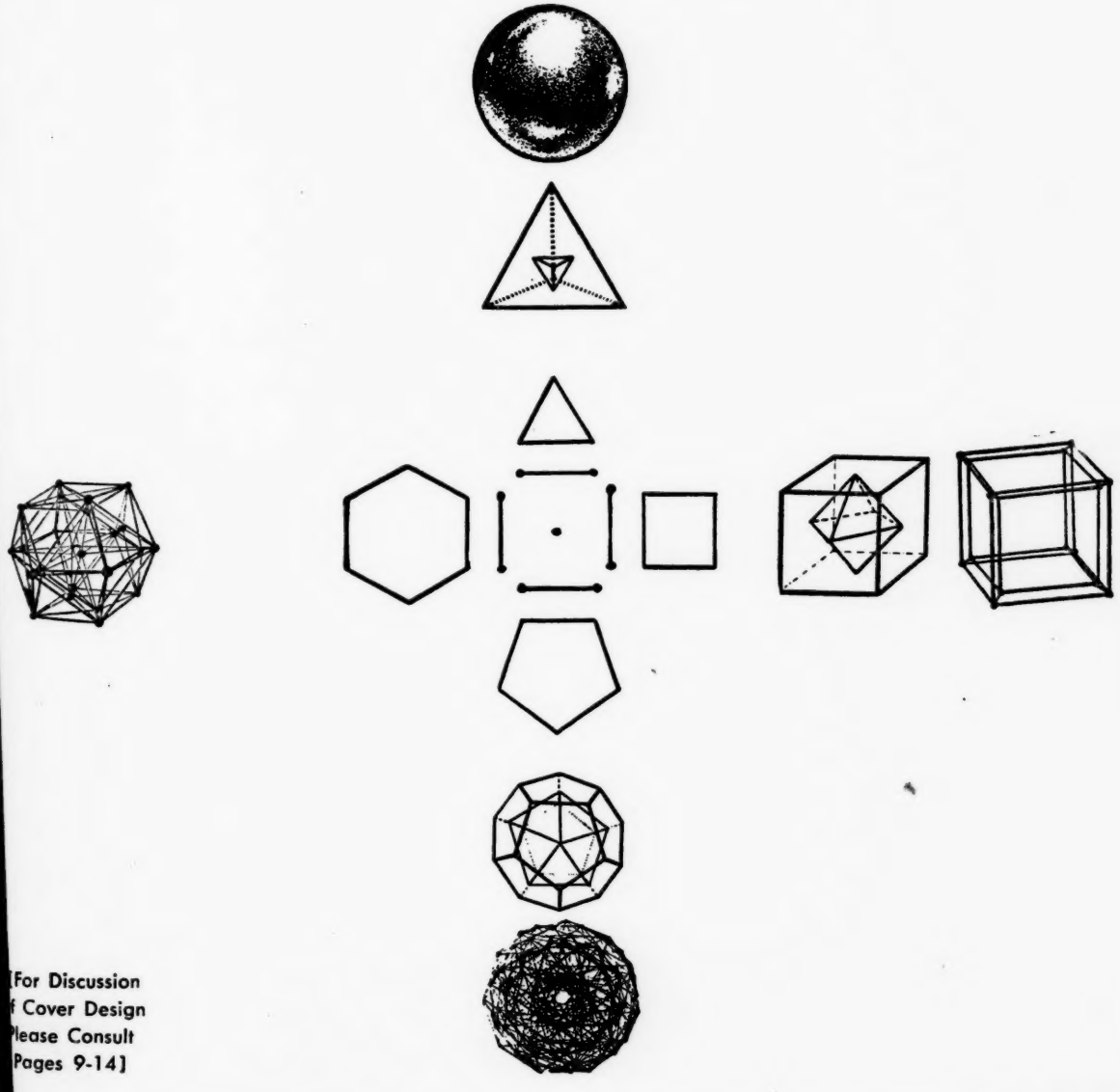
MAIN CURRENTS

IN MODERN THOUGHT



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MAIN CURRENTS IN MODERN THOUGHT

A co-operative journal to promote the free association of those working toward the integration of all knowledge through the study of the whole of things, Nature, Man, and Society, assuming the universe to be one, dependable, intelligible, harmonious.

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"Ah, but a man's reach should exceed his grasp, or what's a heaven for?" — BROWNING

Editor: F. L. KUNZ Associate Editor: E. B. SELLON

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AIMS OF THE FOUNDATION FOR INTEGRATED EDUCATION

The Foundation is incorporated under the laws of the State of New York as a non-profit educational organization. Contributions are tax deductible.

The corporate statement of Aims declares that the Foundation has been established:

1. To collect, create, and distribute authoritative materials which will encourage the development of unified overall concepts in education; to improve the balance of relationships between the physical sciences and the social sciences; to inquire into the phenomena of purposive activity in nature, man and the universe.

2. To assist teachers to understand and use such materials, and to develop an active, realistic, comprehensive philosophy which will communicate to their students the unity, coherence, and beauty of the world in which we live.

3. To remedy, solely by such educative measures, the conceptual and hence the ethical, social, economic, and political breakdown of our times, looking to a peaceful world order.

The members, associates, and staff of the Foundation realize that the progressive discovery of unifying over-all concepts concerning man and the universe is not a task to be performed successfully in isolation from the historical, social, economic, and political context of our times, nor in terms of application less than global.

The work of the Foundation is wholly educational, yet referred constantly to the contemporary scene in all its aspects, no less than to the total available wealth of human experience and knowledge.

MAIN CURRENTS IN MODERN THOUGHT is published quarterly to call attention to significant contributions to learning currently being made by leading workers in the multiple fields into which knowledge has come to be classified. It relates these advances to each other and to the classical and contemporary views of Eastern, European and American thinkers. It is designed to save time for the reader by providing a vantage-ground from which the whole world of knowledge may be surveyed and kept in proportion as it moves toward integration. Its editors assume that the principles of art, the universals of philosophy, the laws of Nature and Man as formulated by science, and the truths of comparative religion, can be orchestrated into a harmonic, meaningful, ethical essay of teachings which can and should be made the central core of curricular study in the educative process at all levels of development. In condensing text, square brackets [ ] indicate editorial interpolation. Three dots . . . in the text indicates a word, phrase or passage omitted in the interest of brevity or clarity. Other usages are standard. $3.00 a year. Foreign $3.50. Contributors to MAIN CURRENTS enjoy full liberty of opinion and expression in these pages. *Copyright 1950, by F. L. Kunz, Port Chester, New York.* *to whom all communications regarding MAIN CURRENTS IN MODERN THOUGHT should be addressed. Entered as second class matter April 13th, 1946, at the post office at Port Chester, New York, under the Act of March 3rd, 1879.*

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FOUNDATION FOR INTEGRATED EDUCATION

News and Notes

The Foundation has benefited from two recent conferences with professors of education of Columbia Teachers' College, Brooklyn College, New York University, Temple University, Yale, Harvard, the New School for Social Research, and other institutions. The gap between the thinking of faculty responsible for the training of teachers and those in the general courses of arts and science departments is all too frequently apparent. Sufficient headway was made in these discussions to establish a basis of future active cooperation, and as a practical program is developed, it will be reported in MAIN CURRENTS. Professor Theodore Brameld of New York University and his colleagues at the Center for Human Relations were host for these discussions. A committee formed to continue the development includes Professor George E. Axtelle, New York University, Professor Lester Dix, Brooklyn College, and Professor Harold Rugg, Columbia University, together with officers of the Foundation for Integrated Education.

Discussion is proceeding regarding the development of a Course in Concepts, which would expound the chief concepts of the natural sciences, of social sciences, and of the humanities. It was agreed during the discussions at the Center for Human Relations that such a course would be a primary necessity for many teachers of professorial rank, as well as for graduates and teachers-in-training, besides being urgent public business arising from educational and general humanitarian needs.

Plans are also under way for a workshop in New England in late August, 1951, to which institutional representatives will be invited to assist in the development of the course details, and to participate either as students-for-credit or professorial staff. Arrangements will allow of family style living, and afternoons will be reserved for holiday excursions and informal activities.

A copy of the Proceedings of the Stillwater Conference, *The Nature of Concepts, Their Inter-Relation and Role in Social Structure,* conducted by the Foundation for Integrated Education, has been sent by Oklahoma A. & M. College to every member of the National Education Association group registered as responsible on given campuses for general education programs. Subscribers to MAIN CURRENTS who are actively engaged in educational work should please notice that if they are members of curriculum committees or concerned with integrative work, they are entitled to a copy without cost. Others may order copies of this significant booklet at $1.50 per copy from the Foundation for Integrated Education, 130 East 44th Street, New York 17, N. Y.

Among the responses to the articles in recent issues of MAIN CURRENTS, "Some Elements for the Synthesis of a Contemporary Culture," by Howard Lee Nostrand of the University of Washington (Vol. 7, Nos. 3 & 4) and "Toward Consensus by Correspondence," by Hornell Hart of Duke University (Vol. 7, No. 4), has been a request from Werner Albrecht of Copenhagen, Denmark to translate and circularize the article in the Scandinavian countries. This request from Denmark leads one to suppose that the achievement of a consensus on some basis or other all over the world is now considered feasible. We are sure that readers in other countries as well will participate in this effort toward consensus.

F. L. Kunz opened the University Course at Bucknell University in February. The course was initiated in its first three years by Dr. Herbert Spencer, then President of Bucknell University, 1948; Dr. William M. McGovern, Northwestern University, 1949; and Dr. Ordway Tead, Chairman of the Board of Higher Education, New York City, 1950. It was for the University Course in particular that Bucknell University received the Foundation's initial citation in 1949 for work in integrated education.

Independent expression is being given, apparently, in scores of centers of learning scattered over the world to the need for group activity in the progressive solution of the increasing problems. A Swiss correspondent reports upon the activities centered in the faculty at the St. Gallen Technical Institute. Lectures given by Professors Weizsacker, Mitscherlich, Jean Gebser, and others, constitute an inquiry into factors important in the achievement of insight, derived from the very sources in contemporary science which expressed in industrial and social outworkings are destroying us, but which, used in formulating insight, would enable us to use these advances for the general welfare. Specific attention is given to space-time, quanta, para- and depth psychology, the lag in biological theory, and the like.

Our correspondent reports also effective activities along these same lines centered in the University of Turin. This group is planning an important 1951 conference on this subject. Some account of the program appears in *Dialectica,* May 15, 1950.

INTEGRATIVE STUDIES FOR GENERAL EDUCATION

The four papers below constitute the Symposium, "Integrative Studies for General Education," conducted by the Foundation for Integrated Education December 28, 1950, at the Cleveland meeting of the American Association for the Advancement of Science, Section Q (Education).

OBJECTIVES AND NATURE OF INTEGRATIVE STUDIES

Kirtley F. Mather

Harvard University

It is especially appropriate that this Symposium on Integrative Studies should have been organized under the auspices of the A.A.A.S. As you know, this is the one body in the United States that attempts to bring together those who work in all the widely ramified subdivisions of modern science. It includes not only the physical and biological sciences, but also the social sciences; it embraces agriculture and economics as well as nuclear physics and celestial mechanics. Among us there are able representatives of those who work on the very frontiers of research, of understanding and of knowledge at the present time, as well as many who devote their lives to the dissemination of what is already known and the training of future generations. All of us are aware of the disintegration which characterizes modern life. Any thoughtful consideration of the present situation, whether we think of ourselves as individuals, as citizens of one great nation, or as members of the world-wide family of mankind, leads to the conclusion that disintegration, chaos, unrest, frustration, are appropriate words to use.

We who are involved in the educational process are especially disturbed by this situation. We are keenly, painfully aware of the chaotic nature of our world, and we recognize the heavy responsibility that rests upon us and our colleagues to find proper procedures, more effective techniques, to deal with it. We acknowledge our weaknesses, the ineffectiveness of many of the methods of the past and we highly resolve to do a better job in educating the oncoming generation than has ever been done before. This, I take it, represents the spirit with which we are gathered in this room for this symposium.

Certainly we are all conscious of the fact that in almost every institution of higher learning there has been, during the past few years, an attempt of one sort or another to improve the curriculum of studies, the techniques of the teachers and the processes of education. Every college or university that I know has had a committee to make plans for the revision of its curriculum. Many new courses have been introduced, sometimes as part of a program of general education, sometimes as "core courses." In every instance there seems to be the aim, or at least the desire, to bring together the fragments of knowledge, to transform the existing chaos into something with at least a semblance of order, to change the tendency toward disintegration into a tendency toward integration.

All this, of course, is evidence that college and university faculties are quite generally aware of the changing demands that are placed upon education in these critical times. At this mid-point in the Twentieth Century, education must aim to do something more than help our young men and women attain the technical ability to earn a living. Preparation for citizenship in the modern world must be stressed above every other objective. It is not enough to build bridges of understanding across the chasms of prejudice, ignorance, and fear that divide mankind into fragments. Those chasms must be closed, and the human world must become as truly one world as is the physical world that constitutes our dwelling place.

We are all aware of the reason for the present disintegration of mankind. Humanity lacks the firm foundation of shared knowledge, of basic understanding, and of common purpose that are essential to the forward march of mankind. Education has become diffuse, diversified and atomized. Everywhere the trend has been toward increasing specialization of teachers, toward the finer and finer sub-division of faculties into disparate departments. Analysis of subject matter has gone so far that the need for synthesis of the various intellectual disciplines is now readily apparent. Basic in almost every concept of general education is the desire to shift from the centrifugal tendencies that seem to accompany analysis to the centripetal ones that ought to accompany synthesis.

It is no accident that the analysis of the nature of the world and of man has already led to the development of overlapping fields, such as biochemistry or geo-physics, but the recognition of such fields does not solve our problem. There is

something more fundamental that must be tackled. The problem that is involved in our efforts to equip the forces of education so that they may deal adequately with the body, mind, and spirit, with science, art, and ethics, with technical skills, aesthetic needs, and social relations, is a problem that cuts to the very roots of all our thinking and of our research. To solve that problem we must focus attention on the integration of knowledge itself, rather than upon the acquisition of a smattering of information from many disciplines. One of the criticisms of general education is based upon the fact that it may easily degenerate into the mere presentation of bits of information picked up in as many fields of inquiry as there is time to survey during a semester or a year. To correct any possible tendency towards that type of general education, we must admit that we need something other than information now available. It will require research, as well as the collection of the results of research already done. If we are going to make education an integrating process, we must have integrative studies. Hence the title of this afternoon's symposium.

Integrative studies may be expedited by a cross-fertilization between the minds of those who now work in various disciplines. The relations between the sub-divisions of knowledge presented at different hours, by different professors in different halls, may be discovered and proclaimed. That discovery and its announcement will go a long way toward bringing into mutually harmonious coordination the otherwise independent fragments of knowledge, but it will not fully meet the requirements. If you were to overhear several senior students talking, you might hear one of them say that "our professors have stuffed us full, but what does it all mean?" This is a very searching question. It causes us as teachers to withdraw momentarily and try to find not only the answer to the question but the reason why the question was asked. The mere exposition of inter-relationships between diverse results of analytical research will not answer that question. The inter-relationships, the overlapping fields, the cross-fertilizations between the disciplines, these are only the superficial aspects of integrative studies. More important is the search for basic concepts and underlying principles that may be valid throughout the entire body of knowledge, that serve as the common roots from which the various branches draw their vitality. To my mind, integrative studies for general education must involve the quest for basic concepts and underlying principles. Such studies must go down to the very roots of the tree of knowledge; they must deal with the structure of the universe and its fundamental directives.

There is good reason to expect that when they are discovered, the basic marching orders for the organization of the universe will prove to be not only very potent and profound, but also very meaningful and simple. Thus conceived, integrative studies would therefore prove to be an essential part of the quest for an understanding of reality. Certainly, all educators recognize the desirability of gaining some such acquaintanceship with fundamental principles and basic concepts as this implies.

The paths to such knowledge are probably many. As a man of science, I would not for a moment dare to affirm that the only path to knowledge is that pursued by the scientist with his special technique. Every scientist who is true to his calling must always recognize that there are other paths to knowledge than the one he is following. And certainly the bases of belief are very diverse. Even within so well integrated a group as that in this room, there would be found many different foundations for the beliefs that we share. Nevertheless there is good reason for believing that the many fragments of knowledge may be harmoniously integrated with each other into a unified whole. Here I prefer the concept of integrated knowledge rather than the concept of unified knowledge, although I hasten to admit that the differences between these two concepts may be differences in semantics rather than in reality.

Regardless, however, of the terms that we use, it is apparent that a primary objective of integrative studies would be to bring order out of chaos. But here I must warn against a possible danger. If we are to integrate our knowledge in an orderly fashion, it is at least implied that we will share our beliefs. Shared beliefs, concepts that are acceptable to a great many people, seem to have great validity. The more numerous the lines of approach that appear to come to the same focus, the more certain we are that the concept upon which they focus is true. The more widely a belief is shared, the more trustworthy it seems to be. The danger is that shared beliefs may be clothed with an aura of dogmatic authoritarianism; they are likely to be established as orthodox. No one who is concerned with education for citizenship in a true democracy can fail to sense the significance of that danger. It is not dogmatic authoritarianism that we are seeking. It is instead the sharing of our beliefs in humanity, with appropriate awareness of the tentative nature of all beliefs, even though they may be acceptable to many.

This, however, provokes an important query. If integrative studies lead to concepts universally approved, can there still be freedom for experiment, for individual initiative in the world of scholarship, for the reaching out into the unknown in hitherto unproven or undiscovered ways? The answer, of course, depends upon whether freedom is a function of order or of chaos. It is my belief that there is more beneficial freedom in an orderly organization, regardless of the

level — physical, biological or social — at which it is found, than there is in any chaotic assemblage of materials, or persons, or ideas. Hence I would expect that as we discover beliefs and concepts that seem to be universal, and are shared by individuals working in a great diversity of fields of investigation, we may at the same time increase rather than decrease the freedom for the human mind and the human spirit.

But now I must explain why I said that there is good reason to expect that such studies as I am suggesting will yield fruitful results in common understandings, in fundamental concepts, in shared beliefs. That expectation is based in part upon certain recent developments in the natural sciences. Very similar general concepts have been independently developed by investigators who have been working in widely separated fields. The correspondences are all the more significant because they are based upon totally different facts. The men who developed them were largely unaware of each others work. They started with conflicting philosophies and yet have reached remarkably similar general conclusions. Knowledge concerning the arrangements of fundamental particles or units of energy within the atom is paralleled by knowledge concerning the remarkable chains of equally potent units within chromosomes, to which we apply the name genes. The similarity between the structural regularities within crystals and the symmetries of order exhibited by structures amongst living organisms are also among the many parallelisms and congruencies that have developed despite the compartmentalization of modern research. These must have some common meaning.

To discover that common meaning will probably require organized teamwork. It was a team composed of thousands of individual members that achieved the organization of materials and processes in such a way to release the energy bound within the nuclei of atoms, and it will presumably be a team of similarly close-knit individuals that will discover the common meaning of all these innumerable facts of life. The members of the team, those who are to engage in these integrative studies, must be specialists, each of them expert in some one sub-division of the many scholarly aspects of modern life, but each must be concerned with the practical application of knowledge as well as with its acquisition. More important even than that, each must be a humane scientist with a keen awareness of moral and ethical values. Men who fulfill to some extent those specifications should be brought into contact with each other and be provided with the means and the time essential to the sort of research that is now necessary. The catalytic agent that will draw them together, that will stimulate them in their studies, that will hold before them a promise of rich returns, is, of course, the common need of distraught humanity. It is only in a time such as this when men and women everywhere are crying out for assitance, for guidance, for leadership, that we can hope to have the necessary impulse toward this type of study.

Fundamental to any effort to meet the needs of mankind today, is the requirement that we seek just as urgently and effectively as we can, for an understanding of the common foundation principles which, like the roots of the tree, give vitality to the many branches of learning such as those which carry the various names of the sections of this Association. I submit that those who are foolhardy enough and valient enough to devote time and energy to such an enterprise deserve at least the commendation and sympathy of all their colleagues.

TEAMWORK IN BUILDING A GENERAL KEY-CONCEPT PROGRAM

Schiller Scroggs
Oklahoma A. & M. College

An administrator has just as essential a part in the total complex task of conserving, advancing, and disseminating knowledge as the scholar. The administrator's task is to bring to institutional decisions a clear perception of the total picture of human affairs, a realistic grasp of conflicts as well as of agreements, and an earnest feeling of personal responsibility for providing the academic means for solving both public and institutional problems requiring the application of knowledge. It is his duty to provide the scholar opportunity to apply his scholarship to the needs of the times. To do this intelligently, the administrator must have a program. The building of this program requires that he form a tentative and comprehensive understanding of what the scholars are presenting, but it does not require the administrator to be a scholar in a strict sense of the word.

The true administrator is led by the nature of the situation to speak definitively on issues concerning which he is not an authority, and his justification must be that he understands reasonably well what he is talking about even though he is accepting most of his knowledge

quite second hand, and that he does this for the purpose of forming and effectuating an administrative program.

Thus the administrator who has concluded that integrative education is the better theory and that the key-concept is the best agency for applying it is immedately up against the problems just implied. He has three courses of action open: (1) he can impose his own ideas (maybe); (2) he can wait for a faculty group to initiate (how long!); or (3) he can initiate and seek to involve his faculty personally, to get commitment in a very real sense to his proposal. To do this, he must present and be prepared to defend the key-concept idea, although he is neither social scientist, philosopher, psychologist, nor specialist in all of the fields that are to be integrated. Will you permit a personal example of how one administrator is seeking to present the key-concept plan?

After seeking to establish the position that to define general education as "what everybody needs" is not only inadequate but ill-founded, the point is made that we actually have the age-old problem of the relation of the general to the particular, and *vice versa*. If we concede that this relationship cannot be convincingly resolved in favor of one or the other as the controlling or "real" factor, we can accept the dualism as at present unresolvable and try to devise an operational compromise which will not be nullified by the internal contradiction. It would seem that our educational philosophy should propose and present in as carefully tested terms as possible the best organizing principle for all general education. Some assumptions must be adopted tentatively as a beginning and held subject to rejection if the consequences which are hypothesized do not in fact occur.

Through such process as this, a theory of general education has been evolved at Oklahoma A & M College. Two related processes were carried on which cross-fertilized each other: (1) general courses were set up tentatively and taught; (2) progressive effort was carried on to formulate a theory of general education. The first was not only a testing ground but a veritably inexhaustible source of suggestions for the second; the second gave consistency and a basis of critical review of the first. This led to what has been termed the "key-concept" approach. This approach proposes that the structure of a general course should be a system of key-concepts as contrasted with the comprehensive logical system characteristic of traditionally organized university sequences. A key-concept should be the sharply defined abstraction or generalization in the system leading up to it, a resynthesis of appropriate subject matter taken from the several fields of knowledge that are to be integrated. Direction is imposed by the teacher by keeping activities within the frame of reference constituted of the structure of key-concepts. Through this structure, and by use of the pertinent organized knowledge from broad subject-matter fields, the teacher leads the students to develop their own organizations of knowledge. These organizations, if the teaching be successful, will be approximations of the key-concepts of the curriculum. Thus the key-concept as stated for curriculum purposes should include or clearly imply definite forms of action for the learner as well as descriptive abstractions. This comes very close to saying that key-concepts should be stated at least in part in "operational terms" — operational from the standpoint of the student, that is, not the teacher.

The characteristics of a key-concept are unity of effect, breadth, importance, and life-orientation. The impact of a concept upon the mind is a single, unified impression. It explains by integrating one's knowledge within a large clarifying whole. Such concepts are indispensable for relating experience to well-organized systems of meaning. These organizations are life-oriented; that is, they consist of knowledge which is in terms of the needs of the man in the street. It has at least three elements: the intellectual, the affective, the behavioral. Thus the key-concept is not merely a logical construct, but a mental construct organizing and unifying experience into a meaningful and functional whole.

These provisions constitute an attempt to get away from general courses that are no more than congeries of traditional subject-matter segments. The end is difficult of accomplishment, because it compels genuine resynthesis of the materials from diverse disciplines in the development of as yet unconventional concepts. It will require long and cooperative research to select and state the desirable key-concepts and to choose and organize the necessary subject-matter, learning experiences, and contributary materials. Obviously, some of the biggest minds must contribute devoted service. This is the area of greatest hazard in general education. Minds that are doctrinaire, or interested almost exclusively in highly specialized problems, or skeptical of the possibilities of post high-school non-vocational education for most young people will make their best contribution through their demanding insistence upon proof of progress. Perhaps the positive leadership must come from a newly self-conscious group from all disciplines whom we may term "generalists." Certainly the method of activation must be one of teamwork, of integrative administrative technique.

Integrating Faculty Interest and Effort

The central principle in building a general key-concept program is that the program must be an integrating center of institutional interest and effort. This does not mean that every person will be involved in it as a primary concern, for there

are other tasks to be done, and these will command the first loyalties of their respective groups. Yet it may be fairly said that the problem of general education is so very important that all should feel some positive concern for it. How to get this positive concern and how to maintain it is the first problem of the person charged with the administrative responsibility of building and effectuating the program.

The proposal should first be presented for consideration not as a set of prescriptions to be taken bodily, but as a model whose detail is presented for the sake of clarifying the abstractions involved. Careful thought must be given to anticipation of the effect which the proposal will have or appear to have upon the whole dynamic social field involved. The responses of individuals as individuals and as members of groups must be foreseen, and the expectations and demands which they overtly make upon the institution anticipated, as well as the unspoken ones which motivate all kinds of resistance tactics. The purpose of such anticipation is not to circumvent conflict, but to build a way for the desired response.

This requires that he who would carry through successfully a program so intimately linked with the basic interests of a faculty as this must see clearly the field of human motivations and find valid ways of relating the program to common concerns. Unity of goal is the aim. Some modification of the goal is not only to be permitted; it is to be expected. But the program must commend itself to every one to some degree, and strongly to most.

The usual way to insure intimate concern is for a committee to be appointed, whose personnel must be alert, dynamic, positive, and resourceful. Members must represent all views. (It is a tactical error to omit the opposition; such action leaves it strategically in improved position and uncommitted to a fair examination of the issues.) The committee must be given time for study. This has two considerations: (1) duties of individuals should be reduced to insure energy for study and discussion; (2) the date of final report should permit unhurried and careful consideration, but not be so long as to insure a lapse into indifference. Finally, the committee should be furnished with adequate opportunities for investigation.

We come now to the launching of the program and the continuing problems of its maintenance.

Faculty-Administrative Action, Immediate and Continuing

There should be no action until not only the committee but the faculty is ready to act. This means that the committee members must discuss issues with their colleagues not on the committee, and in general that all the techniques of stimulating cooperative thinking must be used. Agreement must be the goal, otherwise techniques of evasion, division, or suppression will be used effectively when the program comes up for adoption.

One must view controversies as evidences of unsolved problems; one must keep thought centered on ideas rather than personalities or factional interests. The faculty must feel that they are free agents, that the program is not going to be "put over" on them. This means that emphasis must be placed upon getting out the issues. It must be assumed that interests are basic to action and that such action often will reveal real as opposed to simulated interests. The most frequently encountered negative interests are those such as (1) desire for recruiting courses, (2) dislike of "competing" courses, (3) apprehension of loss of prestige, (4) inability or unwillingness to consider an alternative course organization seriously, (5) preference for a fixed or customary system, and (6) secret opposition to the purpose of a program for any but the intellectually elite. An alternative and more general classification of these negative mind-sets is: (1) unenlightened self-interest, (2) prejudice, (3) rigidity, (4) dogmatism, and (5) preference for routine. But let it be said that while these negative attitudes will be encountered, we must remember that no other institution is as committed as the college or university to positive and rational action. In the long, long pull, there is a force operating on the side of those who are searching for honest and intelligent solutions.

Concluding Comments

The key aim, then, is to bring about a new unity or integration of interests in which all will have responsibility and a part. In achieving this aim, care must be exercised to discern between the dramatic and the significant. The academic man appreciates the dramatic where it belongs — on the stage or the playing field. He will exercise a very potent sixth sense in weighing a statement for significance and a terrible finality in rejecting it for sham.

The analysis is by no means complete. It would need to be pushed back into that very obvious and as yet inadequately studied function we call leadership. But enough has been said to illustrate the essentials involved over and above the indispensable scholarly tasks if teamwork in building a general key-concept program of general education is to succeed. Especially must it be regretted that no specific attention has been paid to the important task of securing inter-institutional agreements. For the conviction lies deep that only through an integrated program of key-concepts can the present chaos and confusion which characterizes the general education movement in America be brought into a reasonable order. Complete uniformity is neither desired nor sought; but we can do much better than at present.

THE ROLE OF A BIOLOGICAL FIELD THEORY IN EDUCATION

F. L. Kunz

Foundation for Integrated Education

I.

The general education movement was prompted in this country principally by the disparity between modern man's material achievements and his social, moral, economic and political competence. Through it, higher learning was to do its part in arresting the deterioration of society by correcting over-emphasis upon vocationalism.

From the beginning of the movement it was clear that contemporary knowledge is too vast and too complex to be taught as a whole at the descriptive-and-operational level. The criteria required to control the inevitable sampling have been arrived at in practice by arbitrated opinion and administrative fiat, necessarily, for lack of a philosophical consensus. The outcome for the most part was the now familiar pattern of selections from physical science, social studies, and humanities.

From the early days of the movement it was also evident that mere slices of learning were inadequate. To counteract specialization's effects by encouraging the student's interest in many or all major aspects of learning, is to commit ourselves to offer knowledge more and more as a meaningful whole. This task is also impossible of performance when confined to the descriptive-and-operational level.

Secular colleges do not possess an official philosophy. Indeed, except to some degree in the exact sciences, there is no body of approved, consolidated, far-reaching concepts collected and taught. Hence for any conceptual interknitting that might be done to encourage philosophical insight, the teachers of the general course became responsible. Under such conditions a quickening of interest in the student may be effected if the courses chance to be well devised, and if the instruction is inspired.

But effective conceptual integration of subject-matter, constituting the beginning of an authoritative philosophical consensus for a given campus or for this confused country, is not likely to be achieved by this procedure in any reasonable time. In fact, it will be my purpose to try to show that a consensus will be impossible until a certain hiatus of knowledge is filled in. Since the true alternative to authoritarian indoctrination (which as a nation we repudiate) is a democratically achieved consensus which gets its force from the worth and reasonableness of a common educational experience, our present frustration is dangerously stultifying.

The specific cause should be a matter of primary national concern. If it can be determined, we must then see if we can correct it. To this we now turn.

It is necessary at the start to be clear upon one point at least: The hope for a meaningful and enduring world consensus lies, broadly, along lines of reason and philosophy and, specifically, along lines consonant with scientific standards. This does not mean that what we now accept as established knowledge is enough, but that the basic positive methods used to achieve present established science are good, and the results acceptable, as far as they go. There are bound to be premature erroneous personal conclusions as to the constitution of man and the nature of the universe, and the relations of these two, based on present limited science findings. These faulty deductions are to be charged against their hasty promulgators, not against basic scientific attitudes and methods.

As befits a high-ranking cultural discipline, science has many techniques. Of these one group, namely, those of exact science, has important prior claims over all others, if insight is to be an object. For exact science gets its authority from the internal mathematical and logical structure, and is thus by its very nature philosophical in character. In addition it gives us effective and increasing mastery over nature, and thus proves out as a species of realism. Exact science is therefore coin of the realm for a world society.

The exact sciences of matter and energy are well structured, and display year by year a progressively improving internal authority. The general consensus they offer derives from the content itself. In fact, progress in structuring them has been so conspicuously accelerated this century that a general field theory may presently be taught, comprehensive of all major material phenomena. However, the subjects, matter and energy, are insentients, hence the values obtained are in the learning experience, not in the content.

The situation we have just noticed, typical of physics, chemistry and astronomy, is almost exactly reversed in social studies and humanities. These have little or no meaning when divorced from values, but at present are only loosely structured.

In between matter, as such, and man, as such, lies the region of the life sciences, as such. Man is rooted in life, first, and experiences matter only secondarily. In life sentience appears, making occasion for values, since without pleasure and pain values do not even arise.

And now we confront a puzzle. The central-most subject of biology is organization. Yet the singular fact is that despite life's importance to

us, and its opulence of forms, the mathematical and logical *over-all* structuring of biology is rudimentary when compared with that of physics and chemistry. This state of affairs is known to all. Because of it, life has frequently been interpreted philosophically in terms of mechanism by the unscientific device of ignoring or postponing discussion of the special subject matter: sentience, organization, and self-directed functional form. This has led to conceptual impoverishment. The alternative has been an inadequately structured vitalism which attends to unique subject matter, but does not greatly enlarge the sovereignty of the exact sciences.

So long as we remain content with samples of knowledge in general education, loosely knit with a few principles, we can live with this failure in biology to offer a general structuring comparable in exactness, scope, and acceptability to that of physics. But if we look upon general education as the authoritative means to stimulate culture and insight, the conceptual hiatus under notice is intolerable. All manner of substitutes may be offered in lieu of the extension of structuring from physics through biology toward man and society. But we would do well, I think, to recognize these as being in part what they are: improvisations necessarily substituted for the philosophical lag in the life sciences.

The ideal way out of our frustration is clear. We are required to bring the life sciences up level with those of matter and energy not by reductionism, but by applying basic exact science methods throughout biology. In contemporary terms this means a biological field theory which embraces life-data inside and outside the scope of physics and chemistry. This implies in turn that biophysics and biochemistry are not enough. Organisms are sentient and display psychic activity. There is therefore a subject we cannot neglect, biopsychology. Many creatures are self-sustaining functional forms rich in symmetries and asymmetries, some apparently explained mechanically, others inexplicable. Whatever their rationale, they provide a special topic, bio-esthetics. Organisms have a unique relation to space (functional morphology) and to time (evolution, the maintenance and advancement of order amid entropy). A space-time for life would have to account for these few specimens of topics, and for many others, if social studies and the humanities are to be demonstrably linked in a valid fashion with the exact sciences of matter and energy to make an intelligible valued whole.

The chief practical questions prompted by these considerations are fairly obvious:

1. What factors, hitherto not exploited singly or as wholes by biologists, are at hand and suitable for the structuring of life-sciences?

2. If the suggestions along that line which follow seem to have promise, can they be formulated in a program of research? That is, can the problems be stated in a way that suggests specific inquiries into parts of the subject, which may in turn be significant to the whole?

3. What practical set-up and procedures are implied, additional to present familiar practices in the advancement of biological knowledge?

4. What would a sustained, systematic, and sufficient program cost?

5. Would an accelerated effort be worthwhile?

We may have confidence that biological science will eventually achieve an over-all structuring. This last question is intended to suggest that special efforts might have rapid results of particular importance to society during the present times of confusion.

The first question alone calls for immediate answer. There would be no point in concentrating attention on the well-known need to improve the over-all structuring of biology unless there were reasons to believe that something fresh could be suggested. The time left may therefore be devoted entirely to a few items which promise at least the beginnings of a biological field theory. Our account here must necessarily be in skeleton form.

II.

Contemporary physics is concerned, first, with energy; second, with the quantum series, which begins in the non-picturable atomic world, and appears in the range of aided and unaided vision as molecules and crystals; and, third, with the relation of energy to these particulates, massed up as matter.

To give rational wholeness to physical phenomena, two major concepts are introduced, under realistic necessity: force fields and space-time. Because they are not directly perceived, fields are held by some to be but convenient fictions. For present purposes they will be conceded reality, and space-time will be allotted at least those properties which natural motions require as background. We shall assume that if space-time is useful to explain motion in physics, it should be found appropriate also to biology, wherein, however, its features are to be determined by the special ordered changes which occur in living nature.

Contemporary biology also has much to say about energy and quanta. The latter appear in living cells in such form as genes, protein and other molecules and micellae generally and as crystals, both those occluded in cells and also engendered therein and built up as cellulose walls in plants. While the cell is alive, these particles carry electric charge patterns which change or disappear at death. In higher organisms especially, thermal and other physical and chemical phenom-

ena are also subject to living control. Within limits, then, the directive role of life and the functionalism of form seem evident. Nevertheless it might be reasonable to believe that the directive role is only apparent, not real, that life is only an epiphenomenon, and hence that the electromagnetic field theories can presently be extended to account for living creatures.

But biology offers important novelties in space-and-time activities which lie far beyond the present boundaries of physics and chemistry. It is these which force use to look for a special field theory appropriate to biology. Reproduction exemplifies these imperatives. It allows organisms to go on as specific functional forms in space and adaptively as meaningful unbroken causal series for long ages of time. This is singular in itself. But more: Everything required to effect this seems to be passed along as a potential in the genes and germ plasm. There is nothing equivalent to this recognized outside biology, as that science is at present defined.

It is difficult to see how we can avoid the notion that there is an appropriate special space-time ground which provides the properties displayed in these and other familiar but unique features of life. It may be technically difficult to establish the existence of the necessary details of the required field structure within a single free-living cell, where we may suppose that the contents and the activities are all significant. But if the germ cell be held to be the abstract of the adult organism, then the *kind* of content and motion in the cell, namely, streaming of protoplasm, metabolism, mitosis and meiosis, can be considered as working out and stating itself in development and growth, metamorphosis and mutation. Perhaps this is tantamount to saying that living motion, in the strict sense, is *sui generis,* and that is why the end result is a self-proportioned form in space, ongoing by repetition in time.

The present proposal, then, is that the *essential* methods of modern physics are to be developed in studies of life to suit the data, taken in their entirety, as befits the standards of exact science.

The method indispensable to successful description of fields and space-time is mathematics, in the usual categories of geometrical principles and attendant or additional equations. We require a field geometrically so structured as to account for the symmetries and asymmetries and the behavior of living forms. The results must embrace palaeontology, genetics, cytology, morphology, taxonomy, and every other department of the life sciences, and it must lead to acceptable systematization of them.

The magnitude of this proposed undertaking may seem much more formidable than the task which Michael Faraday and others created for James Clerk Maxwell and his successors. But there are features which give encouragement.

In the biological field — if there is one — the test objects are given. The very opulence and diversity of life provides that thousands of aspects of its geometry are ready at hand for study. Already many hundreds of particular studies contributory to the structure of the life-field are known, such as principles of phylotaxy, cotyledon-leaf-and-plant-part groups, specificity of chromosome numbers, shapes, sizes and behavior, growth proportions, relations of organ masses to body weights, and so on.

A suitable geometry is also available in advance, just as appropriate geometries were at hand for Relativity.

The Euclidean character of the microcosm generally, and of quanta in particular, is fairly well established; and biological forms depend on a fine world. Certainly at the point where the molecules of pure substances arrange themselves upon space-lattices as crystals, we have Euclidean space-fillers.

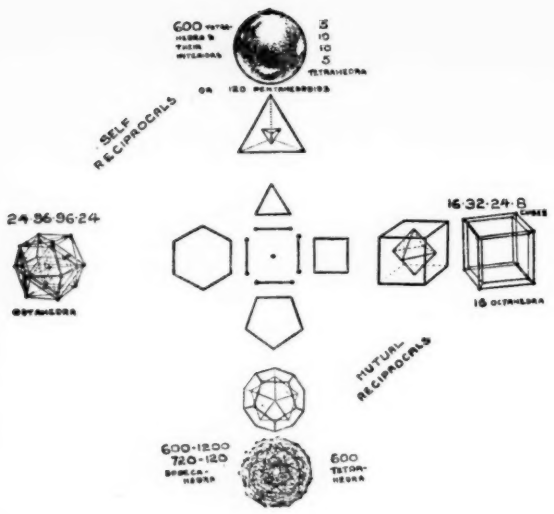
The geometry we seek cannot be confined to the three dimensions of space, and time taken separately, the system to which D'Arcy Thompson limited his interpretation of the geometry of life in his book *Of Growth & Form* (Macmillan, 1942). We need a space-time geometry, because living systems are in incessant motion. But this need also can be satisfied from mathematics at hand. The four-dimensional Euclidean regularities have been studied by Alicia Boole Stott, H. P. Manning, and many others. Recently they have been reviewed and consolidated in *The Regular Polytopes,* by H. S. M. Coxeter (Methuen and Co., London, 1949).

We therefore proceed to make a specific suggestion concerning the possible role of these four-dimensional analogues of the familiar regular convex polyhedra.

In three dimensions, Euclidean geometry provides us with five regular convex polyhedra, or six, if we count the sphere as a polyhedron with an infinite number of sides. Since the tetrahedron is self-reciprocal (that is, has a vertex opposite to the center of each face), they come in reciprocal couples. The dodecahedron and the icosahedron are mutually reciprocal, as are the cube and octahedron.

In a four-dimensional region, required for space-time, analogues of the foregoing three couples all recur, and are joined by a fourth, namely, a polytope with 24 vertices, 96 edges, 96 triangular faces, and bounded by 24 regular convex octahedra. It is therefore self-reciprocal.

Four-dimensional space thus provides us with as many couples of reciprocal polytopes as there are kingdoms in nature.



The accompanying plate (here reproduced from the cover) lays out the series from point to representative three-dimensional models of the four-dimensional polytopes. Below is the tabulation of the properties of the latter.

Representative models of the four reciprocal couples of polytopes are displayed at the extremities of the figure above; five, if the sphere be taken separately. (For full discussion, and modelling, see *The Regular Polytopes,* H. S. M. Coxeter, Methuen, London, 1949.)

THE REGULAR POLYTOPES

	Vertices (Points)	Edges (Lines)	Surfaces (Planes)	Boundaries (Solids)	Shape of the Bounding Cell
1. Pentahedroid	5	10	10	5	Tetrahedra
2. Hypercube*	16	32	24	8*	Cubes
3. Hexadekahedroid*	8	24	32	16**	Tetrahedra
4. Hexakosiohedroid	120	720	1200	600	Tetrahedra
5. Hekatoniko-sahedroid	600	1200	720	120	Dodekahedra
6. 24-hedroid*	24	96	96	24***	Octahedra
7. The Hypersphere	is filled by 600 equal regular tetrahedra, with their interiors.				

These three are the Euclidean hyperspace fillers with 16 cubes at a point, 24 tetrahedra**, and 8 octahedra*** at a point. The 24-hedroid has no regular convex three-dimensional analogues, but can be represented in a plane by the hexagon, regarded as a solid of zero volume. Items No. 1 and No. 6 are self-reciprocal, No. 2 and No. 3, and No. 4 and No. 5 are respectively mutually reciprocal, thus providing four, with the hypersphere, five systems.

To the right is the series point, line, square and cube-octahedron, ending with a correct perspective model of the four-dimensional analogue of the cube. Above this figure are the numbers of its vertices, edges, square faces, and cubic cell boundaries, and below are the corresponding data for its reciprocal, the four-dimensional analogue of the octahedron, which is bounded by 16 octahedral cells.

Running vertically downward from the center is a series ending in a model appropriate to the dodecahedron (and icosahedron) with the numbers of vertices, edges, faces and bounding cells also indicated.

To the left runs the series appropriate to the 24-hedroid. Since there is no regular three-dimensional representative here, a space is left blank. The hexagon is its correct representative in the plane.

Vertically upward is the series appropriate to the tetrahedron and pentahedroid.

The suggestion is that the reciprocal nets connected with the terminal figures constitute the basic field geometry, respectively, of crystals, plants, cold-blooded animals, and warm-blooded creatures, specialized in the four geological eras. The assumption is that the life-field is geometrically totipotential (i.e., is the evolutionary matrix in respect to organic development), and that the geometrical nets associated with the analogue of the cube and octahedron came into play first, in the earth's crust, and remained in expression, to be joined by the geometry appropriate to plants, both occurring in that kingdom. The structure of the field is thus displayed in natural forms progressively; and in each higher kingdom, cumulatively.

III.

When the series of reciprocal couples is referred to natural forms, immediate confirmations of their probable usefulness come to light.

Here we have opportunity only to notice a conspicuous feature of the argument.

Experts familiar with crystallography and structural chemistry have established the role of the cube and octahedron in the geometry of their subject matter.* In general it may be said that these figures provide the basic frame of reference for inorganic crystals, broadly, the mineral kingdom. Besides the foregoing positively established state of affairs, there is a significant negative statement which can be made about the geometry of this kingdom: the regular convex dodecahedron does not occur in inorganic crystals. The nearest approximation is, I believe, one form of pyrites,

**The Nature of the Chemical Bond,* Linus Pauling, 1940, Cornell University Press.

but the dihedral angles are unequal. In short, the overwhelming evidence is for a basic cube-octahedral geometry for the crystals.

A few years ago the suggestion that inorganic crystals are in any significant sense a part of the life series might have sounded quite fantastic. But William Stanley's work on the tobacco mosaic virus may be the beginning of a new outlook, giving earlier data of relation of crystals to life fresh meaning: For crystals are occluded in many types of living cells, for purposes which, I believe, remain obscure. Woody plants engender within their cells crystals which migrate to the walls to build cellulose. No less significant is the fact that there are now known a few hundred substances of organic origin which display the optical properties of crystals when, in their pure state, they are held between certain temperature ranges. The notion of living cells as aperiodic crystals thus becomes an interesting corollary of a whole system.

We have, thus, reason to put aside the idea that the bifurcation of nature into living and non-living occurs when crystal cells give way to protoplasmic cells. Instead we conceive of inorganic molecules and crystals as indispensable to life, and as joining with organic molecules in the fluid system of the cell to make possible the expression of a well- and consistently-structured field.

The suggestion is that evolution is the sequential exploitation and display of the geometry of the life-field, from the simpler cube-octahedral systems of the inorganic, to the richer system of the dodeca-icosahedral system, both being unitedly displayed in plants; and so to animal forms and tissues, where the field displays an additional complex from the twenty-four hedroid couple.

The contents of the cell are doubtless selectively maintained in accordance with the geometric properties of the field appropriate to the species, exercised through the specific numbers, shapes, sizes and behaviors of the chromosomes and genes.

Where, then, is the bifurcation in nature between living and non-living? I would be inclined to say that none is directly apparent, and probably none exists. There are merely ordered systems of many magnitudes, among the largest being the whale, the greatest dinosaurs, sequoias, and beds of crystalline rocks, the series going down and vanishing out of sight as single cells and quanta. If there is a bifurcation, it is between the ordered and the apparently non-ordered, but in fact even this may be fictitious.

We are facing the facts which suggest that inorganic molecules and crystals are the necessary basis of life, having come first presumably in the evolution of the planet. We are but suggesting that the mineral systems display an internally consistent geometry based upon the cube and octahedron, and that this is in turn part of a larger, closely-knit, geometric system, and that we are therefore impelled to inquire whether the rest of the kingdoms of nature exploit the rest of this geometric series.

In principle, there is nothing novel in the suggestion. If investigation justifies the concept, it will then be time to make some revisions in our philosophy of life, and these we must expect. For if a problem has remained for centuries before us, unsolved, we must conclude that the thinking which frames it has had some defects. Changes in that thinking may require of us some considerable adjustments.

Some of the features of that required new thinking are suggested to us by analogy from recent events in physics. It may turn out that the field and not the cell is totipotential. In that case crystals of inorganic origin may come to be regarded as very limited expressions of the life field. In such event, all that is left of the complex space-time order are such items as rational parameters, symmetries, and the like. Everything else is necessarily suppressed, because a static three-dimensional system cannot display more. The evolution of protoplasm, then, was a device which allows more of the field potential to exhibit itself. It affords motion in a liquid medium. Thus the organic molecule can be in constant conjunction with the lower orders of the field geometry displayed by inorganic substances present.

This kind of thinking implies a re-definition of biology, as the science of the self. Crystals are then merely self-forming and self-existent. Plants are self-sustaining and self-perpetuating. Animals display self-motility and self-direction. Thus life becomes both scientifically and philosophically the condition precedent to the appearance of self-conscious, moral, aesthetic man.

The notion implies that the field, besides having as its structure a consistent geometry of great interest, may also have a carrier feature which appears in living forms as sentience. As remarked above, it is obvious that sentience is the root base of values, for without pleasure and pain, why should there be any occasion to choose a course? We would be inclined to look upon the just internal proportions which we call rational parameters as all that is left of an aesthetic and meaningful wealth in the field. In short, the universe is indeed consistent, charged with value, and human life has meaning. The purpose of the studies here proposed is, in fact, that we may bring out of the realm of belief and into the realm of knowledge, good reason, teachable truth, about this intelligible universe.

INTEGRATION IN THE SCIENCES

Henry Margenau
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The difficulties that beset our times are numerous, their challenge disquiets the ranks of educators. *Obvious* remedies for them are easy to enumerate but apparently impossible to put into practice; they involve primarily the suggestion that we compose our international rivalries or else resolve them by war.

As we look below the surface of our world milieu we perceive other, deeper problems to which educators can perhaps turn their efforts with greater likelihood of success than they find in the field of practical affairs. But here, too, there are divergences of opinion as to what constitutes the cultural root of our dilemmas. These divergences, I believe, arise from a conditioning of our attitudes by the thought patterns of the past, patterns that have largely lost their relevance for the present.

The political scientist points to the rise of powerful but conflicting ideologies which electrify the air with tension and with hatred, while preparing for the ultimate doom of man. The economist explains what is happening in terms of greater productive facilities and altered methods for distributing goods. The sociologist notes a general awakening of the instincts for justice and equality among the underprivileged nations of the earth, and the philosopher reports with abhorrence the breakdown of old moral standards across the world. These are time-bound answers which do not point a way.

There is, we believe, a simpler and more basic cause within the present scene which the foregoing traditional diagnoses try to capture but miss: it is the *enormous rate of growth of knowledge*, particularly of scientific knowledge. To see this point clearly is to view the problems of our times in the setting in which they actually arise: in their linkage to *education* and to *research*. In focusing attention upon these elements of our culture we take the first step in understanding and, perhaps, in curing its basic ills.

Those men of affairs who are not immediately concerned with the increasing activity of our geysers of knowledge look upon growing knowledge as the blessing of providence, soon to inaugurate the golden era. But the scholar is becoming vaguely bewildered, partly because he has ceased to understand his colleagues and has thereby contracted his own sphere of usefulness, and partly because he neither sees nor controls the effects of his own researches upon culture as a whole. In his distress he has clamored for an antidote to specialization. The name frequently used for this white hope is *integration*.

The need for it cannot be questioned. For whether one is concerned with the proper use of knowledge, with its dissemination, with the procurement of funds for research, or indeed with our national welfare, the spectacle of knowledge bursting at the seams is always a bad omen and is unwanted. All afflicted nations are aware of this and are trying to do something about it.

The streamlined ideologies of non-democratic nations have perhaps been the first to recognize this need and have, in characteristic fashion, decreed integration from above. The cultural *Gleichschaltung* of the Nazis, Lysenkoism in its various forms, are efficient temporary means for integration. Although wholly unpalatable to a free society, they nevertheless confer a measure of short-range power upon a society using them, thus placing a group that is inattentive to the jungle growth of its science at a tremendous disadvantage.

In a society like ours there must be individuals and movements that carry the torch for integration; suspicious of external governmental constraints, research must find a center for co-ordination within its own sphere, must find unifying points of view which allow organized transmission of its facts through education.

But how can this be done?

The answer depends on what we conceive the structure of knowledge to be. If science, for instance, is a catalogue of well-established facts co-ordinated by their meanings or their uses, then we ought to construct a vast encyclopedia of scientific knowledge. On the other hand, if science has depth as well as breadth and usefulness, its depth ought to be explored along with its factual content. The issue involved here is a crucial one: its disposal predetermines our approach toward integration.

Throughout the history of thought one finds many advocates of the view that science is a super crossword puzzle, partly solved but still with many entries missing. Scientists, particularly in the biological and social fields, are largely given to this interpretation. In consequence, many attempts have been and are being made to unify science by juxtaposing its verified contents. No one can doubt the utility of such endeavors, for they have led to many new discoveries: Mendeleef's table of the chemical elements embodied the principle of juxtaposition and was inestimably helpful in the search for new elements. And there are many other such instances.

The second view has in the past been most widely held by philosophers. Its thesis is equally

simple: the structure of science is three-dimensional. The surface of facts is irregular, pervaded by fissures and indistinct blotches, but forming islands which bear the traditional names of scientific disciplines. To fill in the gaps it is necessary to examine the strata below the surface where, it is hoped, the fissures may terminate and the common foundations of the superficial diversities may be discovered. Investigations prompted by this belief have thus far been none too useful, primarily because they were carried out by philosophers single-handedly, often under the stigma of scientific dilettantism. It is my belief that they are eminently worth encouraging, and that they may lead to more significant integration.

One practical consequence of this belief affects the means whereby synthesis is to be attempted. The principle of juxtaposition relies for its success mainly upon the medium of education, since knowing all the facts is integration. The principle of basic exploration must necessarily enlist both *research* and *education*.

The research involved must analyze the methodology of science. This is, of course, not a brand new field. A great deal of basic integration is now going on in and between the various branches of physical science, as well as those of social science and of biological science. Physical chemistry, mathematical physics, astrophysics certainly spring from the common roots of pairs of disciplines and represent true examples of lasting integration. Similar instances of union are easily cited within the life sciences and within the social sciences. And indeed there is developing a most encouraging rapport between the physical and the biological sciences, manifest in the rise of such new disciplines as biochemistry and biophysics. These are hopeful signs, conducive to optimism. Nevertheless, on closer inspection the situation presents occasion for concern.

Aside from the fact that many links are still missing it is noteworthy that the existing ones are more often names than facts. Mathematical physics is usually what that name implies: physics presented in mathematical terms, rarely inspired by deep sympathy for mathematical problems. And it is nearly always carried out by men in physics departments. My own observation is that the liaison between these two fields is rather superficial; it feeds upon the needs of the physicist and the toleration of the mathematician. This is less true in the boundaries between the more empirical sciences, but not wholly false. At Yale, for example, thermodynamics is taught in four different departments. At first glance this might appear as a magnificent example of integration: in fact, it bespeaks the sorry state in which none of the four departments thinks the others teach the subject correctly from its point of view.

More important and arresting is the appallingly small volume of effort that goes into these boundary fields. A survey of course offerings in Yale University gives this information: In the graduate school the ratio of interdepartmental to strictly departmental science courses is 0.17; in the undergraduate school it is 0.33. (The interpretation, when subject to doubt, was made in favor of a larger ratio. The first of these might be regarded as a sort of index for integrative research, the second for integrative education. Equal distribution of emphasis over special subjects and their boundary fields would require this ratio to be $n - 1/2$ for n special subjects, since the number of ways in which subjects can be paired is $n(n-1)/2$. The number of special subjects in the survey was 12, hence the ratio for this ideal state of affairs should have been about 5.)

Yet, despite the discrimination suffered by joined research fields their yield is considerable, both in their usefulness and in the basic illumination they provide. In terms of effort, therefore, work in them is highly rewarding, although it would be difficult to find a numerical measure for the usefulness per man-hour in any subject. Integration, as we understand it, is therefore not an idle or an academic undertaking. Indeed, observations during the past two decades have led me to believe that a young man now has a better chance for a distinguished career if he starts his own investigations in a relatively undeveloped area of knowledge and makes it known, than if he plunges into the mass research that happens to be fashionable.

The union of established disciplines rarely occurs without prompting. Throughout history, medicine has been the most powerful catalytic agent. It is still the most effective integrating force, but it acts mainly between the physical and the biological sciences. The work now going on in biophysics leans heavily on support from medicine. And again it is medicine which, through its attention to psychosomatic problems, is now forging a stronger line between psychology and physiology.

There is no similar vested interest of sufficient power and generosity to bring about a union between the physical and the social disciplines. Certainly, we have the various branches of engineering which apply the results of the physical sciences in a manner beneficial to society; but to say that they carry physical reasoning into the economic sphere is to misjudge their case. Engineering is not an integrating phase of research and education, because it syphons the usable results from the top of the exacter sciences and develops them with a practical eye. It leaves the residue of method largely untouched within the sciences from which it draws. Society could of course not live without engineering, but it is nevertheless an error to regard that useful art as integrative.

As we look about, we see the greatest lack of truly synthetic effort in that realm which lies

between inanimate nature and society. Universities cannot foster education in this region because there is almost nothing to be taught. There are no vested interests which have made this field their own; hence it has remained sterile. But must it remain so?

Many feel it must because of a doctrine which, though rarely examined, is very widely adopted. It is the doctrine of the *hierarchy of knowledge* which, by the way, has had a most disintegrating effect upon education in the past. It proclaims that the sciences are arranged like an ascending structure: mathematics is the foundation, above it lies physics, then comes chemistry, then biology, and at the very top is social science. The implication is that we cannot understand society without understanding man, nor man without understanding chemistry, and so on down. According to this doctrine it is futile to attempt a contact between the sciences of nature and of society because the two are not contiguous in the hierarchy of knowledge.

I regard this doctrine as unfortunate. Were it true, the science of thermodynamics would be an absurdity, for it allows an understanding of molar matter without detailed knowledge of its atomic constituents. Mass phenomena among animals or men should be more difficult to predict and describe than individual behavior, although the opposite is true. Progress should be made at the top of the hierarchy and never at the bottom, whereas the most exciting discoveries of recent years have occurred way down in the mathematics of the atom. Clearly, the doctrine of the hierarchy of knowledge is bankrupt and should be written off as a loss. There is no reason whatever why physics might not have something to say to sociology and history, and *vice versa.*

Some of the crucial problems of our day lie in this boundary field. We need answers to questions like these: Why is it that physical science is able to predict with accuracy, social science only with a wide latitude of error? The common answer, namely that natural science deals with simpler phenomena, with fewer independent variables, is wholly unsatisfactory; for there was a time when the inaccuracies of physics were explained in a similar way. Why is natural science able to predict things that have never been known before (e.g. atomic bombs) whereas history continues to scan the past, hesitant to become creative (e.g. of a world organization). What about ethics? Can it ever become a science, i.e. a discipline whose tenets are universally adopted and not subject to individual interpretation? The answers to such questions lie below the surface of our present knowledge; their attainment requires effort, but it is not impossible, I believe.

Clearly, what is here at stake is worth winning. But in addition, there is a gain even for the established sciences if integration is more vigorously pursued. Nowadays one hears complaints about our "soulless" science; scientists reputedly manifest too little social responsibility; they live in ivory towers. It seems that any integrative union between the natural and the social sciences is likely to reflect into the former all these qualities which they are now said to lack.

MODESTY AND REALISM

"The Basic Arts program [of liberal education for adults at Cleveland College of Western Reserve University], given its aim of liberal education, is intensely practical. It introduces students to the 'know-how' of the higher learning. They learn how competent thinkers think about the questions in significant fields of learning and how they do productive work in them. The fields are philosophy, natural science, history and social studies, writing, the visual arts, and music. The first step is to find out what is a good question. If, for instance, we (faculty included) can grasp what is a philosophical problem and how competent philosophers deal with such problems, we acquire the essential tools, the 'know-how,' to continue on our own as adequate students of the subject. In the methods used by the human mind in serious inquiry may lie the essential wisdom of the race for an age when the scope of all knowledge is so broad and so detailed that no one can hope to master it all. We (the faculty) think that to grasp the more elementary methods of work, the basic arts, of all six significant fields will constitute a sound beginning of liberal education which is a life-long process and the vocation of civilized man. We would not know about this. Nobody is graduated yet, and we ourselves, to overstate the case, are half educated. . . ."

—John P. Barden, Dean, School of General Studies, Cleveland College of Western Reserve University, in "The Lonely, Higher Reaches of Adult Education," from *School and Society,* Vol. 72, No. 1870, p. 258.

PHILOSOPHIC UNIFICATION AND THE COLLEGE CURRICULUM

A Memorandum

Ordway Tead

Chairman, Board of Higher Education

New York City

I think of this problem primarily from an educational standpoint. Modern curricula are using the divisions of natural science, social studies and humanities to suggest the required areas with which the educated person should become familiar in order to become possessed of some resultant rational clarity, skill, and appreciative power in his own conduct.

Out of widened total grasp in these three large divisions some gains in human competence are inevitable but added knowledge of itself seems to yield disappointing results both in personal attitudes and in resulting behaviors.

Just what is lacking and needed it may be hard to put one's finger upon. But we are concerned about the transcendence of knowledge to wisdom and about the advance from and through understanding to effective and persistent loving social conduct associated with a personal sense of confidence, inner serenity, and larger meaningfulness in human living.

It is these which are the underlying objectives for education — standing behind and justifying the more conventionally phrased academic objectives.

I am willing to assume, and believe the assumption to be based on historic human experience, that the basic ends and outcomes of education are thus essentially philosophic and spiritual in nature. More sound philosophic orientation will lead to and will comprise attitudes which have a clear dynamism toward conduct which has sound purpose and power.

But such a philosophic outlook, such an ability to see the interrelations and future applications of that which is humanly known and knowable, is not a spontaneous achievement. It requires a conscious and sustained effort by teacher and student alike, to see relationships not readily obvious, to see how what is known can be *integrated* to some reasonable extent in a rational way into a coherent, meaningful overview related to creative conduct. This might, should, and does begin to create for the individual who will make the continuing effort, a sense that he can discover some underlying unity about the affairs of the self, of society and of the cosmos. In some modest measure he can come to read for himself some real meaning into the ancient phrase — *sub specie aeternitatis,* and be heartened toward social action by this awareness. He can come to see and feel his own responsible, organic relation to some kind of "eternity" in which he shares here on earth at the very least.

How the development of this more unified philosophic outlook is to be best achieved, we do not yet adequately know.

This is a high priority problem in higher education. But upon its solution is dependent the rise of education above the trivial notion that it means largely the impartation of fact to the view that it entails the infusion of purposeful drive and a meaningful, unified productive dynamism into every learner.

Sustained concern about and study of this problem of integrated learning and integrated outlooks is thus needed by all individuals in college education who are to be worth their salt. Of course, the student's task of integration is *his own* intellectual and philosophic challenge. But equally we can get nowhere with the present situation which might fairly be called one where we find too many blind leaders of the blind.

Teachers require a broader base for their own learning. They require a philosophic view of their own "subjects." They require an integration in their own idea of how the several college "subjects" connect together to make a more comprehensive and intelligible awareness of man in his world.

If there is no coherent philosophic sense in the teacher, what can we expect of the student?

All this means that an organized group of thoughtful people (teachers, students, educators, philosophers) who will band together to think about these matters, and to share in advancing all the wisdom that can be assembled about every aspect of ways and means, both in philosophy and in pedagogical methods, should be able to perform an indispensable service — one which is not being directly tackled by any specific present agency.

I believe that if there were no other phases of possible effort in this general area — and there are several — the Foundation for Integrated Education would find a sufficient necessary mandate in the one here briefly elaborated.

WHAT DO WE WANT: MORE SCHOOLING OR MORE EDUCATION?

Robert Ulich
Harvard University

Only that kind of relativist whose cherished scepticism and desire to be "scientific" are to him of greater worth than reality itself would deny that the cultural progress of a nation depends primarily on active devotion to, and belief in, certain ultimate principles of human conduct. Whatever verbal form of expression these principles may have found, whether they are called the *summum bonum et verum,* the seven cardinal virtues, or the development of character, they all mean the same: that love is more productive than hatred, vision of excellence more generative of culture than lowness, understanding more creative than prejudice, and courage more promising than timidity.

In comparison to these directive principles, which here have only been indicated, the external forms of education are but secondary. But since instrumentalities, used falsely though with best intentions, may lead men into darkness rather than toward light, I may here direct attention to one of our most frequent aberrations from sound educational policy.

More and more, though against the older tradition of his country, the average American evaluates a person no longer according to his personal value and social contribution, but according to the length of his school attendance. To the same degree to which this nation has become bureaucratic, it also has trained itself to believe in credits, grades, school certificates, and academic titles. Nothing, however, is more unrealistic. Some of our schools give their pupils more to learn and think in ten years than others in twelve, yet, some students learn more even in a bad school than others in a good one. Some pupils receive from their teachers the incentive for later development, others "hate" them together with all that reminds them of classrooms. If, say in Denmark, a boy at the age of eighteen graduates from the Gymnasium, he masters his mother tongue rather well, he knows, in addition, three modern and probably one or two ancient languages, and if he has not studied Latin and Greek, he has progressed rather far in the sciences and mathematics. In contrast, most of our high school students believe that they do not need even one foreign language. They belong to a big, rich, and powerful people, and they are told that when an English speaking person talks English long enough, the others will understand him somehow. The question, however, remains whether he understands the others. The negative answer which reality gives to this question explains the disconcerting experience that this nation, though helpful in winning two world wars, never profited from its victories. Rather it was given the rare privilege of financing the peace, as it had financed the war. Our provincial concept of education is also responsible for the fact that the average American, who as a citizen participates in determining the future of the world, allows his daily newspaper to be offensively narrow in horizon and shallow in depth. At the same time, according to expert opinion, the radio and the movie deteriorate from year to year. And so distrustful are we apparently of the strength of our democratic convictions that our State Department deems it wise to prevent a few English and French Communists from attending a conference of professors and artists.

Yet, the United States is a great country; it has risen from colonial origins to a world power, and within its boundaries lives a busy people, to which not only fugitives and immigrants, but men and women from all walks of life have come.

Is this merely the result of more land, more resources, more money, of everything being "bigger than anywhere else"? Certainly not. If I am not mistaken, it is primarily the result of an interaction between men and nature, of an enormous release of energy due to the fact that immigrants, who generally represent a human stock of strength and courage, found themselves no longer in a situation of narrowness and suppression, but in front of seemingly boundless opportunities. And, last but not least, they found themselves before the stern command of frontier life: "Work or die."

However, the situation of the open frontier no longer exists. Of course, the world is still potentially open, unless the curse of nationalism shuts each country more and more off from the other. However, mere physical energy, the hand that can plow the field and swing the axe, even shrewdness and will to power are no longer sufficient. It needs now cooperative thinking and research of excellent quality, together with national and international planning on the highest level of statesmanship. But all this will be useless without the pride, the skill and devotion of the farmer, the craftsman, and the industrial worker. Unless *all* these powers in the nation interact, and unless education helps *everyone* to find and fill his place, there will be no nation. In other words, mere horizontal expansion such as of the frontier days is theoreti-

cally and practically obsolete. Today the nation's energy has to be channeled and disciplined according to meaningful and realistic purposes; depth and form must be added to width.

But those who determine our educational policy still act as if expansion and prolongation were still the main purpose of the American school system, as it was a hundred or fifty years ago. They plan the future of this nation and the whole world, but actually they live in the past. E.g., the Report of the President's Commission on Higher Education believes that in 1960 a minimum of 4,600,000 young people should be enrolled in non-profit institutions for education beyond the traditional twelfth grade. (At present about 2,400,000 students are enrolled in colleges.) But what is going to happen with all these students? Will they still have the boundaries of life open? Yes, the best of them will, because the productive and courageous do not depend on given material conditions; they make new productive agreements with life, not only for themselves, but also for their fellow men. Also, human society will always look for professional people of high quality.

It is false to believe that prolonged schooling as such will be rewarded in the future. If we send more and more youth, whether or not they like it, into primarily verbal schools, no longer for eight or ten years, but for twelve, and perhaps for fourteen, we will not create more education, more initiative, more happiness, more democracy, and more integration within this nation. Rather we will prevent those who have the stuff for being educated through practical life, and not through sitting on school benches, from having the education that is adequate to their real talent. If our highly industrialized society does not need the hands and brains of younger people, thus forcing them to remain in educational institutions, then, at least, let us create for them schools which are not just parking places, but opportunities for strong emotional and intellectual development in connection with some concrete and practical doing: really good — not narrow — practical departments in our high schools, or work camps, or re-forestration projects, or international work batallions, which could help in the building up of backward and devastated countries. Let us not make them tired of schooling before they enter the great school of real life. Let us not get them used to accepting their assignments passively, but let us make them anxious to create their tasks out of their own initiative. The most essential factor in the building up of a mature person and a mature nation is not information, but intelligence interacting with a sound emotional life, and especially a sound and well-directed will. Unless we take into account *all* these qualities, unless we even cease to think that productive intelligence can be produced in isolation from the total and acting personality, we will have a lot of semi-educated people with crippled emotions, and our schools will become more and more powerful artifices.

One may answer, the more somebody has learned, the better it is for him. That is true provided he has learned something in line with his later life; if it is contrary to it, he becomes bewildered and frustrated. A man is happy in his occupation only if it somehow materializes that which he has hoped and worked for during the years of preparation. If the expectancies built up during his education remain unfulfilled, in concrete terms, if he finally becomes a mechanic rather than an engineer as he dreamed of, he probably will not be a good and happy mechanic, who, as such, is a very useful person. And if he sells ice cream in a drug store rather than being a chemist in a university laboratory, then he will not be kind to the little ones who want a cone, but will become bitter against society.

Is the idea of a socially adjusted and articulated school system undemocratic? The answer can be "yes" only for people who refuse to think the problems of democracy, of freedom and equality to their proper ends. None of these concepts can mean that youth are buoyed up with illusions about a sort of life that does not exist, so that they become disenchanted the moment they meet the stern facts of reality. In other words, educational ideologists who believe that schools as such are instruments strong enough to neglect without punishment the psychological, economic, and political conditions of society, such ideologists will not help in improving their society and in making the ideals of democracy more and more real. Rather they will create first confusion, and then some kind of tyranny for "restoring order." For, what Francis Bacon says of man's relation to nature holds true also with respect to his relation to society:

> "Man, as the minister and interpreter of nature, does and understands as much as his observations on the order of nature, either with regard to things or the mind, permit him, and neither knows nor is capable of more."

However, these words should not be understood in the sense that education be considered nothing but an adjunct to economics and politics. Education has the power gradually to change society. But though faith in ideals is the greatest force of progress, only that faith and those ideals can achieve this goal which are in congruence with, and not against, the laws of nature and of mental and social development.

Mere prolongation of the period of verbal schooling, as is now the popular mode, is no answer to the problems of society but a danger.

THE CIVILIZING OF COMPETITION

Arthur E .Morgan*

In today's international political philosophy there is much reliance on force and cunning.

"Let him take who has the power
And let him keep who can."

Some of Europe's ablest political philosophers support this view, holding that honor, morality and goodwill are but useful myths, which must give way to force and cunning when real interests clash. More than a hundred years ago the attitude of power politics was described in words which almost exactly fit the practice of today:

"Conscience! That is a jest; a mere engine of priestcraft: all right is founded in power; let us once get that, and who will dispute our right?"

Yet law and honor repeatedly re-emerge, to take control of human affairs. Those same cynical men who see force as the ultimate control are compelled to rely on the loyalty, morality and goodwill of their followers not to betray them, and to provide internal strength and unity. When certain American corporation executives have cynically exploited the public, they nevertheless have preached morality and loyalty to their followers in the rank and file. Their structures are too complex and far-flung to be protected by surveillance. These despised myths of morality and good-will come to life and take root, first in the more intimate personal relationships and family, and then in larger social groups.

Cynical reliance on force and cunning is one extreme of competition. The other extreme is to condemn all competitors, and to hold that everywhere cooperation should take its place. We have an intuitive feeling that neither of these extreme views is sound, yet we have a vague feeling of being visionary when we rely on goodwill, and of surrendering our best principles when we rely on competition or on force.

Can there be a satisfactory solution to this problem? I believe we can be helped to a clearer view of the right place of competition and cooperation in human affairs if we observe their place in the biological world, for the life of plants and animals furnishes some very close analogies to the processes of human society.

What is competition? Almost no characteristic of life is more universal. Life may have originated on the earth many times, only to disappear because some element necessary to survival was lacking. To continue and become dominant, life must be adaptable to a great variety of conditions. It must be persistent, holding on in adverse circumstances until it can make adjustments. It must reproduce itself, or be ended by aging or accident. It must aggressively push out in all directions, or risk elimination by circumstances.

These are elemental qualities which living things must have if they are to keep on living. But these very qualities make competition, for in the process of multiplying, expanding, and overcoming obstacles it sometimes happens that the obstacle is another living thing, which also is trying to expand and occupy more territory. Effort to overcome such living obstacles we call competition. The process thus is as natural and inevitable as life itself.

In that process of expanding and overcoming obstacles, and of replacing losses of every kind, life has become exceedingly prolific. For example, consider a single one of the thousands of species which inhabit the sea. If every codfish egg should complete its life and reproduce itself without hindrance, and if that process should remain unbroken, within 20 years all the oceans of the earth would be solid codfish.

During the past century inventions and improved organization have made the lot of men less difficult, and the population of the whole earth has doubled. If every man and woman between the ages of 20 and 40 should have four children, and if their descendants without exception should do likewise, within about a thousand years there would be one person for every square foot of land on earth. At present there is a great voluntary reduction in the birth rate, but that may be only a temporary condition, due to the fact that men are not yet adjusted to a new level of relative prosperity. If even a relatively few families for any reason have many children, their offspring, unless somehow eliminated, soon will replace those strains which tend to small families. Except for rare intervals, more life of most kinds has been propagated than can survive, and a process of elimination by competition was inevitable. In the long run this has been true of men as of most other species.

There is an inherent advantage to competitive selection which is not always realized. From generation to generation individuals vary, at least slightly, from their parents. This variation tends

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to be heterogeneous, that is, random in all directions, good, bad, and indifferent. If all offspring survive, this random change from generation to generation will result in deterioration. For instance, in dark caves loss of eyesight is not a handicap, and so is not eliminated by competition. Fish living in dark caves for many generations tend to become blind, apparently from gradual accumulation of these random changes. In the open ocean poor eyesight is quickly eliminated in the intense competition.

If all human children that are born should mature and have offspring equally, gradual deterioration probably would result from the accumulation of undesirable changes. Unpleasant as elimination by competition may be, it seems essential to the maintenance of biologic quality that there be a surplus of births, with elimination of the less fit. Intelligent selection and design can greatly reduce the waste from that process.

Security never is complete. The aggressiveness necessary to give relative security for a species results in intense competition for the individual. The process never relaxes for long. When any favored species or person or nation rests on its oars and takes life easy, some less favored ones will challenge that ease, with readiness to work harder and to live on less. Ease and shelter from competition are fore-runners of elimination. Individuals and nations seek respite from intense competition. Men have largely eliminated the former deadly competition with other species, but against their fellowmen they still are hard at work trying to create charmed circles within which they shall be relatively free from competition. Men crave opportunity to expand and fulfill their lives to the utmost, like a tree in the open meadow, rather than like trees in the forest, to be closely and rigorously confined by the presence of others. In such an effort a successful man may buy a private estate, where the crowd may not enter. Similarly, his financial resources serve to push back competition, and enable him to expand his personality, perhaps almost unhindered by the crowd. To secure such protection men and nations build walls, tariff barriers, immigration restrictions, and armament. They indoctrinate people's minds to accept their preferred status, and make laws and establish usages to the same end.

A man differs from the tree in the open meadow in that while the tree can spread its branches only a hundred feet or more, the craving of a man's spirit for expansion may know no limits. A Pharaoh could consume the life of a great nation to build a monument. Genghis Khan laid waste a continent and destroyed ancient civilizations to satisfy his pique.

Yet, the security which men crave never is completely realized. The less fortunate try to break through these walls; they disregard legislation; they ignore customs, codes, taboos. If birth control promises to solve the problem for one nation, then hungry and expansive peoples bring pressure from without, while within there is pressure from below. The crowd may storm the Bastille and behead the king. The great estates may be parcelled out to peasants. The hereditary wealth of the English ruling class, entrenched from without by a great navy and by a myth of invulnerability, and at home by carefully indoctrinated servility and by law and custom, may be challenged by hungry nations without, and by a labor party within.

When the old shell of privilege breaks, and new men or new peoples have risen to power, they in turn begin to repeat the process. So the wheel of competition turns again, and the law of tooth and claw or of the sword will continue to rule through the ages, except as some other principle or process enters into the course of events.

But a new principle has entered. It, too, like the principle of competition, can be illustrated from the world of plants and animals. It is probable that for long ages the only living things were one-celled organisms, each living its individual one-celled life, each fighting for itself alone. Then slowly there developed the process of associations of cells for mutual benefit. An account of that process would be the story of organic evolution. Of the billions of cells that compose a human body, each lives its own individual life, carefully separated from its neighbors by a cell wall, but carrying on constant communication and traffic with them. These cells unite to form tissues, and they into organs, each carefully separated from its neighbors, but cooperating with them. Finally they unite to form the human body, which has a life and purpose of its own.

This great cooperative of the human body strives to maintain an ideal environment for each cell. The cells thrive best when floating in a liquid bath, so each one is kept in a solution of remarkably uniform quality. The salinity of this liquid is kept nearly constant, and the balance between acidity and alkalinity is delicately, but powerfully, maintained. The temperature in health is kept within about one degree, whether in tropic summer or arctic winter. The turgidity, or pressure, and the electric charge in each cell are controlled.

Almost never could one-celled creatures, each working for itself alone, achieve such perfect environment. Seldom has any dreamer pictured for man so perfect a utopia as has been achieved for the individual cells of the human body. If one-celled creatures, which live and fight for themselves alone, could philosophize, knowing nothing but their one-celled world, they might hold that the only sound philosophy is, "Each for himself, and the devil take the hindmost"; but the course of organic evolution would give the lie to that

doctrine. Supremacy has come, not chiefly by competition of individual cells with each other, but by replacement of competition by cooperation in living and working together as organisms. Yet the object of the great cooperatives of cells which we call plants and animals is not the total elimination of competition, but rather to make possible more effective competition on a larger scale.

Constant pressure for a place in the sun might be expected to lead men to rely on the law of tooth and claw. Repeatedly that attitude is adopted for a time, as in international affairs at the present moment. Yet mankind through the centuries on the whole becomes continually more orderly and restrained in his competition. This development is inevitable. Competition itself drives men to cooperation, goodwill and mutual confidence, because groups in which there is internal unity are more effective in competition than single individuals, or groups in which there is internal conflict.

A family in which members live and work in unity will be better able to compete with the outside world than one in which strength and resources are consumed in internal friction. Similarly, the community or the nation within which the members most completely cooperate with and trust each other can best hold its own against the outside world. Competition between families, communities and nations inevitably drives men to increased cooperation and to mutual confidence within such groups. It may be said that, historically, cooperation is a direct development from competition, a way of displacing individual competition with more effective group competition. Just as cooperation might never have originated without competition, so also it becomes more and more true in human affairs that competition can be effective only as it is based on cooperation. Consider Italy and Ethiopia. The theoretical rights may have been with Ethiopia, but Italy was superior in cooperation. A high degree of disciplined cooperation is required to design, build and operate airplanes and tanks, and to organize and administer large-scale military operations.

For a time cooperation may be secured by compulsion or by propagation of social myths, but such methods are vulnerable. People come to see through myths, and to rebel against force. Cooperation must be genuine and well grounded to last. The weakness of democracies today is not so much danger of external aggression as it is lack of internal justice and harmony.

A cynical realist like Mussolini is forced to a fundamental inconsistency. While he glorifies force in external relations, his strength for exercising that force depends on internal cooperation, mutual confidence and good-will. The term "Fascism" implies as much.

But now the question arises, what is external and what is internal? The answer is in the doctrine — or myth — of the uniqueness of nationality. Goodwill applies at home, and force and shrewdness abroad. But Italy is not strong enough to stand alone by the cynical doctrine of force. She must have allies, who have similar dependence on force and cunning, with similar myths of racial superiority. Then what becomes of the doctrine of force and cunning in international relationships? Is an ally but a convenience, to be betrayed when that is profitable? How far dare Italy go in making Germany invincible?

Thus the doctrine of force without morality begins to break down, even in international affairs. The same tendency is at work throughout the whole of society, from individuals, families, communities and nations, to societies of nations. In the long run, honor, good-will and cooperation add strength. The cynical view adds weakness. Where does this principle find its limits? Not, I believe, until we have achieved "the parliament of man, the federation of the world."

Mutual confidence, expressed in cooperation, is not a tender growth which must hide in the crannies of the world, and be forever at the mercy of brute force; rather, cooperation and mutual confidence constitute the way by which, in the very nature of things, people must live if they are to compete with the outside world. Cynical force always may have power temporarily to take advantage of good-will, and to have its way. Yet the seeming miracle does recur. Goodwill and cooperation do take root. Cynical force is superseded by equity and order, for time and the very nature of human association favor their ascendency. More and more human societies are coming to be like biological organisms in which work of individuals gains tremendously in power by specialization, but in which cooperation is imperative. The size of such cooperative units tends constantly to increase.

Cooperation does more than sum up the combined powers of those who cooperate. It multiplies those powers, sometimes to a vast extent. The energy generated in a modern power plant is vastly more than the combined energies of those who have taken any part in generating that power. The range of a telephone system is vastly greater than the combined range of the voices of its employees. In fact the two have no necessary relation.

These cases illustrate the fact that cooperation with specialization of work is not just a process of summing up powers. It is a creative process, bringing into existence powers and achievements far beyond the sum of the individual powers of the cooperators. Against genuinely, intelligently planned cooperation, individual action is relatively impotent. The larger the scale on which genuine and vital cooperation becomes established, the greater will be the creative increase. Yet cooperation to be most effective requires goodwill, mutual confidence, and unity of purpose. There is

no equally sure foundation for sustained social power. Competition which rests on lack of mutual confidence and goodwill tends to eliminate itself.

In a highly developed cooperative society, diversity of effort would largely displace sheer competition. When a person has found the best place to use his highest abilities, quite generally it will be found that his work has some of the qualities of uniqueness. It does not exactly compete with that of anyone else. It is filling a need never exactly filled before. It is adding to the variety and fullness of life. It is making more opportunities for others, rather than less. A hundred and fifty million people are living in the United States on a far higher economic level than half a million were able to attain at the time of Columbus' visit. Effective specialization of effort, and intelligent increase in the variety of human activities, with a greater degree of mutual confidence and goodwill, have made the difference. The population now has more of the character of an organism, and less that of an aggregation of individuals. Literal "cut-throat" competition is less.

What, then, is the place of competition in a civilized society — in a Christian economic? In an organized society the aim is not for individuals, communities or nations to destroy each other, but for each to find how best it can justify and fulfill its life by contributing to the general good. In such a society competition is not eliminated, but has a new purpose. Its use is to enable each person or group of persons to play the part for which it is the best person or group available. A man should be available for any place only when there is no greater need for him elsewhere.

In a well organized society, competition in finding and holding one's place is essential, and elimination of competition in this sense would be disastrous. The best man for any given place in society is best only by comparison with others who are available. Competition should be the process of exploration and appraisal by which each person or organization would discover its best work. It is the duty of the individual in society to compete. If he does not it is either because he has surrendered hope, or because he has sheltered himself in some privileged position and wants to avoid measuring himself in order to take his fair chance in society.

With this concept of competition as the process by which men and organizations of men find the places for which they are relatively best fitted, the ethics of civilized competition and of a Christian economic begin to emerge.

First of all the aim is not the special good of the individual or organization, but of society as a whole. The primary means of securing this end is the elimination of arbitrariness and caprice, such as in the past has so largely influenced the survival of men and of peoples. Chance and intrenched privilege must be displaced. Those who fill any place should do so solely because of innate excellence, and not by escape from competition by privilege or vested position. Those who fail should be persons or organizations without intrinsic merit. Failure should not result from relative lack of opportunity of any kind.

Next, success must be achieved by qualities which society respects, as good for society as a whole. There must be complete freedom of inquiry and open appraisals. All the cards must be on the table. Success must be achieved by honesty and not by deceit, by merit and not by favoritism — in short, by ethical means. The control and discipline of competition by ethical principles is fundamental to civilization.

No single social force should dominate society. It is when social forces are in right proportion and relation to each other that we have a vital and wholesome social order. There should be enough competition, but not too much. With too little competition there will be deterioration from lack of selection. With too much there is unnecessary tragedy of failure, competition tends to drop to ruthlessness, and discrimination suffers. Wherever men have pretended to civilization they have endeavored, and with considerable success, to bring competition under control, to compel it to observe methods men can respect; but only at the peril of decadence have they tried wholly to eliminate it.

The problem of society is to speed up the process of civilizing competition. Our difficulties are due to imperfect vision of what would constitute a good society, and to the hangovers of instinct and of social habits from a more primitive day. For this process of acceleration to be successful there must be conscious control and design, and not unplanned drifting. There must be steady critical development of social aims. The doctrine, "Ye are members one of another" — that is, parts of a social organism — cannot be realized fully except as a pattern of life emerges which will stand the test of critical appraisal, which has universality of range, and which will give optimum play to the human spirit. Hastily improvised or provincial patterns, such as Fascism or Communism, or the old status quo sometimes called Americanism, may have temporary efficiency, but if they are treated as final values are like the bed of Procrustes. They require humanity to be mutilated to fit them. We must not hold any social or economic pattern as complete or adequate. It must have power to grow and change.

When we undertake to define the social pattern at which social policy should aim, we find questions of ultimate social value still unsettled. For instance, what density of population under present conditions promotes the highest social values? Is it fifty people per square mile, with

great freedom of action and very large resources per capita, or is it a thousand persons to the square mile, with marked social regimentation, and perhaps with much less natural wealth per capita? We have no objective measure of the relative values of different densities of population, yet, as it relates to control of immigration and of the birth rate, this is an active political issue.

Will the greatest social values come from equality in the distribution of wealth, or by distribution according to the usefulness of people to society, or on some other basis?

To what extent is eugenic control desirable? Should increase of population be left entirely to uncontrolled natural tendencies, or should the best stocks be encouraged and the poorest stocks be eliminated?

On such questions there will be honest differences of opinion. As a rule complex social issues are not solved by any simple, direct logical process. Brilliant and far reaching generalizations which seem to simplify and to solve great social issues, such as that "all men are created equal," generally turn out to be over-simplifications. The best adjusted organisms, biological or social, are complex and not simple. In approaching such problems some steps are clear to nearly everyone. We take those steps, and in doing so the next steps become clearer. In eugenics we have few misgivings when we prevent the reproduction of near idiots. In the distribution of wealth we are clear in preventing extremes due to great social injustice. In domestic and international relations there should be greater approach to equality of opportunity. We can stand for fair play and not trickery, justice and not caprice, courtesy and not rudeness, goodwill and not hate. While we continue our search for ultimate social objectives we always find that there are relatively undisputed practical steps just ahead which we can take with assurance. In taking those steps the range of doubt becomes narrowed, and often the residual questions quite dissolve.

A CO-ORDINATED APPROACH TO WORLD PROBLEMS

". . . I do not believe that economic changes alone will meet the real challenge with which we and our program [United Nations Technical Assistance Program] are faced. Economic Development must be accompanied by a corresponding awakening of man's social consciousness and his realization of the individual and community values of such matters as education, culture and health. In establishing our projects, therefore, it will be necessary to ensure a co-ordinated approach to the problems of the requesting country. Increasing the leisure of the worker without teaching him how to utilize the increased time at his private disposal will result only in dissension and unrest. Our program, therefore, must be designed not only to improve the lot of man as an economic unit of world society, but also to improve his self-knowledge and his ability to live in harmony with his fellows as an informed, effective and humane member of his community.

"The financial support of the nations subscribing to our program will not alone ensure it success. We need men and women as well. The kind of person we require for expert service is usually a man, or woman, of some importance in his own country. He must be a competent and an experienced technician in his own specialized field. But he must also be capable of communicating that specialized knowledge in the manner that will make his advice most readily acceptable. He must be able to assist the peoples of under-developed countries to realize their highest potentialities. He must, of course, be free of the spirit of carping criticism, the attitudes of national, racial or cultural superiority that have unfortunately characterized some of the most highly developed civilizations. To secure the right kind of expert, we shall require the fullest co-operation of the governments of the more developed countries. These governments must realize that, having embarked on this program of international co-operation, it may be necessary on occasion to subjugate the natural desire to forward immediate domestic interests to the wider development of a flourishing world economy. To this end, and sometimes that end may not be long postponed, this will contribute to the material welfare of the nations that are prepared to make a present sacrifice."

—Dr. H. L. Keenleyside, Director-General, United Nations Technical Assistance Administration, in "Principles That Govern Technical Assistance Program," *United Nations Bulletin,* Oct. 15, 1950, p. 412

THE OGLETHORPE PLAN: MORAL INTEGRATION

Stanley M. Daugert

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This is the second in a series of news reports on major and notable examples of modern college practice. The editor of this department, A. Gordon Melvin, City College, New York, is interested in receiving similar reports and accounts of work in other colleges and universities. These should be mailed to him in care of MAIN CURRENTS.

The Oglethorpe Plan is a plan of education on the college level deliberately conceived and designed to fulfill what we regard as the most fundamental human need of our time, character and moral understanding; a plan, in short, for the moral integration of education. We believe this need can be met without falling into the snares of propagandistic, dogmatic, or absolutistic indoctrination on the one hand, nor the abysses of moral drift, moral relativism, or moral chaos on the other. There are, of course, other perils in trying to keep moral education at the center of the program, but they likewise constitute challenges which must be faced consciously and readily, not dodged or put aside.

This moral need, if I may call by that name what is really a complex or cluster of many needs, is real and undeniable; however, most institutions of higher learning (apart from church-related schools) appear on the whole to be little affected by it, to judge by the many curricula we have examined, the teachers we have talked to, and the college graduates we have known. Moral education is left either to chance, to the teacher of moral philosophy, or to the disciplinary powers of the student government or the school's administration. Otherwise it gets little attention. The teacher of literature, the historian, political scientist, economist, psychologist, sociologist, biologist, chemist, physicist, and others do not conceive it their task or responsibility to deal with or clarify the essentially moral problems, issues and criteria of character and conduct, freedom and responsibility, and so on. Few are the social scientists, fewer still the physical scientists who believe that their "subject" has or should have anything to do with moral issues, if, indeed, they do not flatly deny the reality or significance of those issues.

To fulfill this moral need we decided upon teaching our knowledge and understanding of human nature, its achievements and problems, social groups and forces, Nature and God, in a series of courses so arranged that from the beginning to the ending of his college education the student would know and feel that he had experienced and studied a program which held a dominant purpose that made good sense from first to last; that made him aware of and gave him some insight into our dominant moral problems, and into possible ways of solving them; that were intimately related to the matters of moral responsibility and judgment; that gave him the conviction that our moral problems were not yet solved but rather that they awaited the men and women of sincerity, sensitivity, responsibility, courage, and wisdom to solve them. We felt that we could not "departmentalize" our knowledge for these ends, but rather that we had to relate each other's knowledge to our own as much as possible, and all this to the end of moral education. Hence, from the beginning seven years ago, Oglethorpe did not adopt a traditional departmentalization scheme. We established instead the Division of Human Understanding and the Division of Citizenship as required, or better, "common purpose" divisions in which the student takes all courses for four years, these courses constituting one-half of his entire program. We also established four other divisions, Science (including mathematics, chemistry, biology, and physics); Business; Community Service (psychology, sociology, teacher education) and Fine Arts; from which the student elects any two, or in some cases, one, if it has two possible electives in it.

Within the two "common purpose" divisions, Human Understanding and Citizenship, we planned and arranged courses on an increasing scale of difficulty and complexity designed to achieve subsidiary ends, but ends in turn to be used as means to fulfill the common purposes indicated or suggested by the titles of the two divisions. The Division of Human Understanding, for example, contains twelve courses (we are on a quarter system) designed to meet, in the first year, the needs of better verbal communication and expression (two courses in "Speech and Writing"), and an awareness, recognition and understanding of what might be called "dedicated character" in its interactions with society ("The Prophets"); in the second year, an appreciation of the principles of personal balance and integrity ("The Achievement of Balance"), order and beauty in the plastic and graphic arts and in certain forms of literature ("Art Through the Ages" and "Ex-

pression of Beauty"); in the third year, an insight into and understanding of several "orders" of truth — historical, logical, or scientific, aesthetic, and moral, and ways of reaching it ("Interpretation of History," "Development of Science," "Understanding of Man": all of these also titled "Philosophy"); in the fourth year, sensitivity to and discrimination of values, particularly the Good and the Right ("Character and Morals," "Man and Society," "Life and Religion": these also titled "Philosophy"). It will be remarked that the universal values of Beauty, Truth, and the Good form more or less the cores around which successively the second, third, and fourth year courses are planned.

An outline of the content of one or two courses in the Division of Human Understanding may make clearer the ways and means of arriving at a perception of some of these values and the needs and problems they are designed to meet. "Understanding of Man" is a course conceived to show students the need and problems of trying to understand some of the many criteria of ethical judgments, to encourage them to find solutions where none seem adequate, to help them take a wise and sympathetic stand by using all their relevant knowledge, and further to show the relation of all this not only to the individual's balance and integrity, but also to the order, peace, and progress of the social groups of which he is part. The reading list in the course varies from year to year, but the following list is typical: Aeschylus' *Oresteia* trilogy, Sophocles' *Electra, Antigone, Oedipus the King, Oedipus at Colonnus,* Euripides' *Electra,* the two *Iphigenias, Medea The Trojan Women,* Plato's *Apology, Crito, Phaedo,* Shakespeare's *Hamlet, Macbeth, King Lear,* Dostoievski's *The Brothers Karamazov.*

Class meetings are devoted almost entirely to discussion of values and value judgments, their criteria and worth. Inevitably we discuss such matters as the basis of the judgments of the *dramatis personae* and the possible motivations of their actions, the "problem of evil," the criteria of just judgment, truth, human dignity and nobility, courage, the nature and function of dramatic tragedy, and so on.

It should be obvious that this course, as well as others in this division, concentrates heavily on moral questions and issues. I should like to emphasize this point by remarking that we as a faculty are agreed that that one of the gravest problems of our times, a problem we feel will face us for years to come, is the lack of responsible character and hence of responsible action in the world today. We feel we must solve this problem, above all, to help create the good life and the good society. We agree with those who, like Dr. Ordway Tead, claim that education for character is a neglected objective.* We are doing our best to make such education part and parcel of our curriculum without either "dragging in" morals, or without being narrowly moralistic.

A final example of a course in the Division of Human Understanding may illustrate how we try to accomplish this. "The Prophets" is a course given early in the student's college career, in the last quarter of the freshman year, because it is meant to set the tone and temper of an Oglethorpe education. It is, of course, a non-sectarian study of the Old Testament prophets against the background of the times and places in which they lived in order to see how these men responded to and interpreted their age in the light of their own insights and in the light of what they conceived to be Divine Will and Purpose. The problems they faced were as acute as those of any civilization, past or present, and their inspired prophecies as answers or solutions are examined not merely as relative to their own times, but as affording examples at least of the driving force and energy for good which we could do well with in our times. The prophetic books of the Old Testament are rich in purpose and example. If we could inculcate their highest standards of character and action into our own lives we should be much further along on the road to the good life and the great society.

The Division of Citizenship, also a four-year common purpose division, attempts to do for the ideal of Citizenship what the first division tries to accomplish for Human Understanding. Broadly speaking, knowledge in the social sciences is aimed at developing better local, national, and international citizenship. All of the courses in the first two divisions, then, represent integrated education with a dominant purpose, the purpose of developing persons to their highest humanity, persons who will have some knowledge of truth, an awareness and appreciation of beauty, an insight into the good, and who will be inspired to pursue these values throughout their lives.

These two divisions, then, Human Understanding and Citizenship, form a nucleus around which an Oglethorpe education is planned for what we may call "making a life." However, since one of the most obvious problems that confronts almost every one of us in modern civilization is "making a living," the remainder of the Oglethorpe curriculum is given over to divisions of Science, Business, Community Service, and Fine Arts, in any two of which the student is expected to register for the remaining half of his program. These divisions are designed primarily, of course, to enable the student to prepare himself more

*"Education for Character, a Neglected Objective," Hazen Pamphlet, No. 22.

especially for a profession or career in industry, commerce, law, science, medicine, education, social welfare, and the fine arts.

Here is another kind of integration, centered on the vocations, or certain of them. We believe this kind is no less useful or necessary than the other, but the important point is that both are complementary. The student who is educated for what I have called "moral integration" but who does not pursue a useful and satisfying profession is paradoxically all too apt to be irresponsible, high-brow, or merely "intellectual." On the other hand, the person who pursues a vocation or profession to the neglect of its ramifications in and on society is just as apt to be irresponsible in another way, as well as narrow-minded, dull, or merely "professional." It is perhaps difficult to say which is the more terrible trap for the unwary student. The Oglethorpe Plan attempts to avoid both, and to create in the student an awareness of the importance of his own essential integrity, the unity of his thought and his action, the dignity of his character and his deeds.

EFFECTIVE LIVING

The following educational philosophy is a summary of the convictions on the basis of which a general education course, "Effective Living," was built at Michigan State College. The material is reprinted from "Source Book for Effective Living" (Michigan State College Press, 1949, $4.50).

(1) *Educators and students alike must be concerned with life goals and values as well as with ways of attaining these values.* We have a joint responsibility for defining ethical issues, becoming aware of our own position on these issues (our values and life goals), and accepting our proportionate share of responsibility. We are also interested in learning scientific techniques for attaining these goals and values. Therefore, this course must be classified both with the humanities and with the social sciences.

(2) *We must consider life as a whole* — wholeness in the sense of interrelatedness and interdependence among:

(a) various aspects of life at any given time, such as vocations, values, avocations, family life, and community activities;

(b) various stages in the life cycle in order to see the present, past, and the future in proper perspective; and

(c) the individual and the society in which he lives, on which he depends, and which depends on him.

(3) *The course must be centered on the needs of the individual.* A distinction must be made between the immediate needs perceived by an individual and other needs, equally real, which he may not perceive. We are concerned with both.

(4) *Needs must be determined, both objectively and subjectively,* from students in the course and from other individuals. This determination of need, both by trained observer and by cooperating individuals, results in identification of many more problems than it is possible to consider in the time available in the course. Therefore, a selection has to be made on the basis of importance and relevance.

(5) *We must be concerned with practical everyday problems.* Therefore, as indicated above, we go first to members of the general public for information on what should be in the course and then to the various specialized areas, such as philosophy, psychology, sociology, education, and home economics for useful data *and* for the theoretical framework.

(6) *We must start where the student is.* Inventories are used to determined knowledge, interests, and attitudes. On the basis of the findings for the group, modifications are made in the materials, methods, order of presenting materials, and the time schedule. Data on individual students are used in teacher-student relationships.

(7) *The course must be individually action-centered* as well as individually need-centered. We must help the student find a satisfactory answer to his personal question, "What can I do about it?"

(8) *The student shares with the staff the responsibility for what the student gets out of the course.* He is responsible for adequate preparation of assignments, for helping to determine what is taken up in class, and for using wisely his opportunities for special reports and selected readings.

(9) *We must continually evaluate in order to determine what results are attained.* We are interested in verbalized response immediately after a student has taken the course. We are *more* interested in verbalized response after a student is out of college. We are *still more* interested in objective evidence of the effect on other behavior. We believe that content and methods must be evaluated and varied as necessary in order to achieve the objectives of the course.

(10) *The course must be dynamic.* Modifications are made as needs are more adequately defined, new materials are available, and more effective teaching methods are developed.

REVIEWS

A TEXTBOOK

FOR INTEGRATION COURSES

Culture in Crisis — A Study of the Hopi Indians, (by Dr. Laura Thompson, Harper & Bros., 1950. 221 pp., illustrated. $4.00) presents at last, an *example* of unified research, and not just a plea for such work. All the necessary kinds of specialists were included on the staff: eighty-five professional scientific, technological, philosophical, and administrative men and women worked it out, not separately, but together with each other and with the Indians themselves. They carried out a thorough-going piece of action research from 1941 to 1949: research which has given a broad, deep, and integrated scientific understanding to everyone, including some of the subjects, some of the Hopi themselves. This research therefore led directly to engineering practice: it permitted the Hopi and their administrators to *diagnose* the independent variables of the crisis, to *prescribe* clear courses of action directed at these variables, and to *execute* these prescriptions; to carry out the prescribed course of action and thereby to gain practical control over the forces of the Hopi culture's disintegration — mental and spiritual, as well as economic and social disintegration. This book thus demonstrates the thesis that unification of science involves integration of science with philosophy at one end and technology at the other.

This book is an answer to prayer for teachers of integration courses. The first chapter states "The Problem." It shows that the culture crisis can only be studied, and therefore also taught, by "social and cultural anthropology, psychiatry, psychology, pedagogy, public administration, linguistics, and ecology working as a team." Each of the next eight chapters gives the signal to a different member of the team to make his play before and with the class (see *Culture in Crisis,* p. 20). And the last chapter, "Two-ply Lariat," calls on the head of the course to consolidate the victory and carry integration further afield, as the first one called on him to mobilize the team. Once the class team, students and teachers, have done this with Hopi culture, could they not undertake study and alleviation of crisis in any community, even their own?

Hopi culture, a most outstanding example of psychosocial harmony, may well have inspired the scientists who studied it. In any event, Laura Thompson's book is so remarkable a demonstration of scientific cooperation in a culture's study and rehabilitation, that it is almost ideally representative of one of the primary research projects of the Foundation for Integrated Education. Its eighth chapter is taken from the writings of a co-founder of MAIN CURRENTS, the late B. L. Whorf. Further, it is cited in the Preliminary Draft Constitution of the Council for Unified Research and Experimentation, as an example and model of the Council's objective. (Its author and her husband, John Collier, who wrote the introduction and as U. S. Indian Commissioner under Roosevelt made the study possible, are, in fact, members of the Organizing Committee of CURE.) *Culture in Crisis is* recommended to teachers of courses in integration throughout the country.

—Edward F. Haskell, Research Associate, Foundation for Integrated Education, Chairman, Organizing Committee, Council for Unified Research and Experimentation

THE URGENCY

OF BEING HUMAN

In the Spring 1949 issue of MAIN CURRENTS an article by M. F. Ashley Montagu was published on "The Origin and Nature of Social Life and the Biological Basis of Cooperation." This was the substance of a lecture delivered before the Rochester Academy of Sciences in New York on April 15, 1948, and served to identify the subject *symbiosis* which, under Dr. Montagu's direction, has formed one of the integrative study projects authorized by the Research Co-ordinating Board of the Foundation for Integrated Education.

As the study progressed, and as interest in the thesis quickened following its presentation in an article which appeared in the *Saturday Review of Literature* in November 1949, Dr. Montagu decided to anticipate publication of the project's full technical discussion by offering to a wider public his general conclusions and the evidence upon which they are based. No doubt he felt impelled thus to steal his own thunder out of that very fellow-feeling, or impulse to love, which forms the theme of this important little book, *On Being Human* (Henry Shuman, N.Y., 1950, 125 pp., $1.95). For it is now, at this moment, when confidence in our ability to live at peace with one another has reached almost an all-time low that we badly need some assurance that the seeds of man's destruction do not lie inevitably within his own nature, to grow willy-nilly into a self-consuming monster. This is what, to all practical purposes, the Neo-Darwinists would have had us believe, and for some years people thought that in order to live a life truly consonant with the advances of sciences, it had to be a case of dog eat dog, and the devil take the hindmost. What all this led to is certainly only too apparent today.

It is to flout such a nihilistic belief that Dr. Montagu has written this book, and he proceeds calmly and firmly to do so, uprooting one by one the destructive fallacies which grew, fungus-like, upon the main stem of Darwin's original theory. Without cumbersome notes or references (the whole book is designed for the lay reader

and is eminently readable by such), Dr. Montagu establishes very clearly, and upon the most substantial evidence, his fundamental premise: that all living things, including man, have a fundamentally social nature whose origin lies in the physiological relationship between parent and offspring and whose expression in co-operation and love is justified in social relationships. In other words, "the ethical conception of love is no mere creation of man, but is grounded in man's biological structure as a functioning organism."

The implications of this discovery are, as Dr. Montagu points out, of the greatest significance. So long as the doctrine of the survival of the fittest had the sanction of science, economic exploitation, racial inequity and anti-social individualism could be defended as "natural" and "inevitable." When, however, it is shown that man is essentially a social being whose dominant biological drives are toward security and love, it is obvious that only in a society which is characterized by these qualities can man fulfill his basic needs. The important matter of how such a society can be won is mainly dependent, Dr. Montagu feels, upon a change to attitudes of mind based upon the principle of love. And he believes that "this is really not easier said than done," for all human beings want to be good and are only confused about means and ends in doing good and securing happiness. If they can be persuaded through proper education that co-operation will insure the establishment of good human relations, they will find co-operative living easy and pleasant, since their dominant drives are all in this direction.

Many reviewers have used the adjective "challenging" in describing Dr. Montagu's book, and rightly so. It is a challenge because, faced with the knowledge that men are inherently social and cooperative, we have less excuse than ever for behaving in an uncooperative, anti-social fashion. Dr. Montagu indicates that the greatest problem which lies before us, that of rebuilding our society in terms of human values, must be solved through social engineering, and that youth must be prepared for the task by education. His challenge is thus primarily to educators, but none the less it extends to all those whose desire for a better world makes them courageous enough to implement knowledge with action. Few of us are brave or self-confident today, yet strength is gained from conviction and courage from hope. It is not too much to say that Dr. Montagu has made a notable contribution to the sources from which men draw their strength and hope.

E. B. S.

HOW TO EVOKE LOVE OF LEARNING

Marie Rasey is a Professor of Educational Psychology at Wayne University. In ***This is Teaching*** (Harpers, New York, 1950, 217 pp., $3) she provides an explicit and detailed alternative to the lecture-assignment-examination straight-jacket: The students air their problems, the class wrestles with its problems, a misunderstanding leads to something better. These do not sound like "chapters in a book." In fact they are not, and this is no book, in the far too usual sense of an author mediating (and macerating) his material.

The illustrations are as real as the text. We want our readers to meet a few of the people (as drawn by Elizabeth White Walker) who, in part, wrote this volume:

EARL WEISMAN, an easy listener.

ELSIE DEAN, a social worker of wide experience and quick incisive tongue.

Dr. Rasey practices what she preaches in her book's motto, characteristically at the end, from Lao-tzu:

> "But of a good leader, who talks little
> When his work is done, his aim fulfilled
> They will say 'we did this ourselves'."

Hence, the title of the book is honest as to its content. This is a rich slice of teaching, transferred to the reader intact. If everyone knew the author personally, it could as well be called *This Is Rasey*. For those who know her know that she is a teacher who *is* her students, not only at the University, but at home at Rayswift Gables, where she lives among and loves some children whose parents are fortunate enough to evoke her help. Dr. Rasey has discovered a secret: to evoke the love of learning, learning must be available in an atmosphere of love.

F. L. K.

IMOGENE HALL, a nurse whose thinking is oriented to physical health.

GEORGE FOLTER, who should have been called Thomas.

COURAGE AND CANDOR ON THE EDUCATIONAL FRONTIER

The considerations which make the book here under notice important reading are easily summarized. The United States is in the most desperate crisis in its history. The sole hope to avert the breakdown of freedom and justice in a democracy is education. The author of this work is aware that schooling without philosophy is not education. He is a professor of philosophy of education at New York University, and in his maturity. When such a man conveys at full length the feelings of a humane heart, he cannot fail to stir citizens who know our peril.

In *Patterns of Educational Philosophy* (World Book Company, New York, 1950, 824 pages, indexed, $4.75), Theodore Brameld first presents the painful actualities of the educational scene, expounds the place of philosophy therein, and relates that discipline to culture. In Part Two he examines three forms of educational philosophy which have won respect: progressivism, essentialism, perennialism. The first attitude is well known. John Dewey is its embodiment in the American mind. The social emphasis is prominent, and realism is the watchword. Essentialism is seen as an attempt to weight equally idealistic and empirical elements. The mind is herein appreciated as of a social nature. On what terms, then, do society and individual essentially meet? Perennialism is the philosophy which concerns itself with the nature of reality, and aims to determine its course from those findings. The author's discussion is acute and well-supported from all important major sources. From page 387 forward he concentrates upon a fourth alternative: reconstructionism. In sum, the discourse now develops the practical possibilities for using recent advances in learning and technology for a more utopian society arrived at (slowly if need be) through education. All aspects of this renascence are discussed: beliefs about knowledge, beliefs about values, forces already present, school administrative problems, political, social, and economic bearings. The program emphasizes cultural, educational, economic, and other lines of research. In fact, its success will turn upon this central feature. It is to be regretted that Professor Brameld did not elect to develop his proposals more adequately in this crucial respect. The changes in philosophy forced upon us by 20th century science are in no one place systematically and extensively examined.

We emphasize this point because, oddly enough, the reasons which are most likely, we believe, to give Professor Brameld's book long life as an educational text lie outside its special scope. Contemporary exact science is decisively aiding that part of the perennialists' cause which rests upon Nature and not upon dogma. *Patterns of Educational Philosophy* will be justified of its faith in practical utopianism because evolution can be shown to be patterned, meaningful, and inevitable, toward good. An educational system which seeks and states adequately the order within this process will fortify our puzzled people, and enable them to draw upon the irresistible powers of the evolutionary processes.

This volume is, nevertheless, an achievement all the more remarkable because it is limited so largely to educational sources and social forces. We put it gratefully on the desk shelves devoted to the books we like to have at hand for reference. In its chosen purpose it has a rare, and promises to retain a growing, value.

We take the occasion to commend also Professor Brameld's *Ends and Means in Education: a Mid-Century Appraisal* (Harper and Bros., New York, 240 pages and index, 1950, $3). This volume reviews major education issues (such as federal spending and indoctrination), and applies reconstructionism forthrightly to the immediate scene. F. L. K.

TWO HOURS OF FORTHRIGHT FUN

The term "essentialism" is in use in some educational circles to describe the ground common to the enduring constitution of man and the persistent characteristics of his society. Since institutions certainly change, and as man (one hopes) evolves, essentialists are required periodically to restate their views, just as perennialists are called upon to cope with cosmological implications of progressive science.

Frederick Mayer of Redlands University has contributed a readable and stirring volume to the American Philosophy Series, *Essentialism*, (Hampton Hall, London, 1950, 220 pages, $2.75). His purpose is not formal exposition of a system, but comment on the changing scene from a point of view. In this way the general reader is not burdened with systematics of little interest to him, but the professional philosopher is left in no doubt as to Professor Mayer's convictions. Nevertheless, enough is said (or example, page 26) to display just how the author looks at the content of philosophy, and to provide the lay reader with a skeletal system.

STATEMENT OF OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912, AS AMENDED BY THE ACTS OF MARCH 3, 1933, AND JULY 2, 1946.

Of MAIN CURRENTS in Modern Thought published Quarterly at Port Chester for October 1st, 1950. State of New York, County of Westchester. Before me, a Notary Public in and for the State and county aforesaid, personally appeared F. L. Kunz, who, having been duly sworn according to law, deposes and says that he is the editor, publisher and owner of the quarterly MAIN CURRENTS in Modern Thought and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily, weekly, semiweekly or triweekly newspaper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the act of August 24, 1912, as amended by the acts of March 3, 1933, and July 2, 1946 (section 537, Postal Laws and Regulations, printed on the reverse of this form, to wit

1. That the names and addresses of the publisher, editor, managing editor, and business manager are: Publisher, F. L. Kunz, Port Chester, New York; Editor, F. L. Kunz, Port Chester, New York; Managing Editor, None; Business Manager, None. 2. That the owner is (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one percent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.) F. L. Kunz, Port Chester, New York. 3. That the known bondholders, mortgagees, and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None. 4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him. (Signed) F. L. Kunz.

Sworn to and subscribed before me this 22nd day of September, 1950, Arden W. Smith, Notary Public in the State of New York, appointed for Westchester County (Commission expired March 30, 1951).

This vigorous little volume sparkles with gleams and darts. "The philosophical system created by outstanding German minds . . . are frequently more logical and consistent then the universe" (page 107). "The Victorian schoolmasters sought to inculcate virtue by daily prayers and by constant floggings" (page 46). If anyone wants to find out what can go on in a teacher's mind (and have much joy learning about this phenomenon), let him read pages 124 and 125! Marvellous!

We have enjoyed *Essentialism,* but must register a complaint: Why no index? F. L. K.

HOW TO BECOME EFFECTIVELY PUZZLED

In *Henry Gross and His Dowsing Rod* (Doubleday, New York, 1950, $3), Kenneth Roberts recounts how he aided and encouraged the subject of his study to perfect his art. Presently this celebrated dowser could determine the place, depth, quantity and quality of underground water. He then dowsed by telephone. Finally long range from Maine (by a map) he determined locations for three wells in Bermuda, where the inhabitants formerly drank rain water. Sir Stanley Spurling, Sir Howard Trott, and Mr. Roberts had wells drilled on these sites, and all three supply abundant potable spring water.

Between October 22, 1949, when (as above recounted) Mr. Gross dowsed in Kennebunkport, Maine, for water later successfully brought in in Bermuda (February 11, March 11, and April 27, 1950), Dr. J. B. Rhine ran a small test of Mr. Gross' abilities, on November 5 and 6, 1949. (Reported in the *Journal of Parapsychology,* December, 1950. These were to determine whether water was or was not running in a pipe. In brief, they were unsuccessful in the sense of being below chance expectations.)

A more extended inquiry into the abilities of other dowsing was conducted by a team of investigators, also in Maine, in 1949. Their report may be found in the January, 1951, issue of the *Journal of the American Society for Psychical Research.* In this case the dowsers' findings were tested by drillings. (The account should be read in its entirety.) The point for us is that the dowsers, successful or not, held that their dowsing is a physical phenomenon.

A remarkable effort to establish this opinion among dowsers will be found in *Psychical Physics,* by S. W. Tromp (Elsevier, New York, 1949, 437 pages, and 1496 items of bibliography, 30-page index, $8). Probably no compendium comparable in breadth and care is to be found in the literature. The author has not convinced this reviewer that he has established any proper physical theory for water divining, but he has provided in one volume a truly priceless source book of data drawn from every major European language.

If the foregoing items are puzzling, the chief conclusion to be drawn is clear enough: We are woefully short on theory for such phenomena, and we are not likely to get far in understanding with them until field theory is developed first in biology. For nothing now known of insentient energy permits us to make dowsing a rational part of physics, in the sense that optics are rested upon field theory. F. L. K.

ALTRUISTIC LOVE IN AN AGE OF CRISIS

The current volume from the Harvard Research Center in Altruistic Love and Creativity is an analysis, by its Director, Pitirim A. Sorokin, of the philosophical outlook of eight men. A chapter on the crisis and another on history judged through art principles precedes summaries of the views of Danilevsky, Spengler, Toynbee, Schubart, Berdyaev, Northrop, Kroeber, and Schweitzer. Part Two is devoted to critical evaluation of these views, and Three to a summary of agreements. *Social Philosophies of an Age in Crisis* (Beacon Press, Boston, 1950, 341 pp. and index, $4) is the third volume in the Center's series, and it focuses attention on a major point in the history of human society: that the cyclism of culture is a fact, and that the Spenglerian forecast of doom is unwarranted.

The volume has other unique value, as a relatively short account of many representative thinkers. For besides his principals, Sorokin discusses briefly the essential ideas of dozens of artists, sociologists, and historians, from Aeschylus to Worringer.

We propose to review the publications of the Center on a later occasion, commencing with the initial Symposium volume, *Explorations in Altruistic Love and Behavior,* edited by Sorokin (Beacon Press, Boston, 1950, 348 pages and index, $4). For it is growing clear that the Center embodies a new educational force. Its director is that rarity, a professor who himself professes firmly something conclusive. Just what that something is is too important to be noted in a phrase. The present volume, *Social Philosophies of an Age in Crisis,* defines it in methodological terms, and adds new definition to the author's earlier works. But what is his meaning as to cosmology and the nature of man? This calls for later and more serious exposition than is here possible. F. L. K.

THEY CRY IN THE DARK NIGHT

Creative Vision, by Richard Guggenheimer (Harpers, New York, 1950, 170 pages and index, $2.50) is concerned with profound philosophical and psychological problems important to artists, the author himself practicing and teaching art. The eternal now, the nature of memory, the evocation of serenity, possession of the wholeness greater than parts, are confronted with admirable directness, and often seized with daring grasp: "Life itself is probably a great form, not perceptible to our young intellects but already surmised by our intuition" (page 1).

The concepts implied or recognized range far beyond their treatment here. This the author knows well. In fact this book, groping for essentials, is another of the honest outcries which sensitive teachers are more and more impelled to make because of the outrageous lag between the foremost sciences and the competence of our philosophies. To have these candors voiced,

and worded so simply, is appealing. But they evoke a kind of desperation in this reviewer, at least. What are we doing to our brilliant young people, denying them that wealth of scientific and philosophical learning which should match their courage and integrity? Where can they achieve a familiarity with the insight of antiquity, the crystalline Platonic Nous, the Brahmic splendor?

We are moved not only by our younger American ve[illegible]. Let us think also of those eloquent Europeans u[illegible]ooted at home only to find their new country on th[illegible] slippery glissade to hell. Consider writers like [illegible]ichard Hertz, conversant with Western and Eastern culture, penetrating, tolerant, gifted, and undaunted. (See his *Man on a Rock,* University of North Carolina, 1946, and *Chance and Symbol,* University of Chicago, 1948.)

Our education has philosophically failed us all the world over. Its psychology and cosmology are yet to be created. Is the full darkness to fall, even though we have the intellectual instruments with which to illuminate our path to peace, inner and outer?

Only our teachers can now respond with effect, and in time, to these cries in the darkening night of Western man.

F. L. K.

THE RETURN OF THE GREEK SPIRIT

In *The Structure of Space-Time* (Cambridge University Press, 1950, $2.75) Erwin Schrödinger, the chief architect of wave mechanics, opens his discourse with a passage that may be widely quoted (page 1). The book is based upon mathematics forbidding to the layman, but what the topic means to any thoughtful educated adult may be judged from these words:

> In Einstein's theory of gravitation matter and its dynamical interaction are based on the notion of an intrinsic geometric structure of the space-time continuum. The ideal aspiration, the ultimate aim, of the theory is not more and not less than this: A four-dimensional continuum endowed with a certain intrinsic geometric structure, a structure that is subject to certain intrinsic purely geometrical laws, is to be an adequate model or picture of the "real world around us in space and time" with all that it contains, and including its total behavior, the display of all events going on in it.

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